Ecologically Significant

Natural Lands Strategy & Policy

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Winnipeg

Ecologically Significant Natural Lands (ESNL) Strategy

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Ecologically Significant Natural Lands (ESNL) Strategy

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Ecologically Significant Natural Lands (ESNL) Strategy

1. INTRODUCTION

1.1 What are ESNL?

Ecologically Significant Natural Lands (ESNL) are natural heritage sites which the City of Winnipeg has identified as important to "creating a vibrant and healthy city which places its highest priority on quality of life for all its citizens" (Plan Winnipeg).

Working Definitions:

The City of Winnipeg Charter defines "sensitive lands" as:

(a) land that is susceptible to flooding or erosion or that has unstable slopes or poor drainage,
(b) areas of special significance for animal, bird or plant life, including wetlands, forests and nesting areas,
(c) land on which any development is likely to harm ecological diversity.

The City of Winnipeg, while respecting this definition, tends to use a broader definition of sensitive lands or natural areas, which looks at a number of criteria including:

- lands and/or waters with natural or native biotic communities representative of the natural ecology of the region,
- lands that have significant animal or bird communities. (Singular species at risk in Winnipeg include the endangered bird, the Loggerhead Shrike and rare plants of the tall grass prairie such as Culver's-root or Riddel's goldenrod.)
- land of cultural or historical significance,
- land that fosters connectivity between natural areas for both wildlife and the public,
- land adjacent to waterways. (Riparian or riverbank areas are extremely important for aesthetics, erosion control, water quality, aquifer recharge, aquatic and terrestrial habitat, corridors, greenways and maintaining ecosystem health).

The term natural area (NA) is often a general term and is used interchangeably with terms such as natural habitat and natural heritage. In the scope of this document these three terms all refer to lands, which support native plants and animals of a mixture representative of the natural ecology of the region. Natural areas are not ornamental

gardens, vegetable gardens, turf grass, athletic fields, grass boulevards, or trees with a lawn understory. It does refer to natural habitat such as oak forest where native shrubs and natural understory vegetation are present beneath the canopy of the trees.

It is important to emphasis the distinction between NA and ESNL. ESNL are natural lands that the City of Winnipeg has protected. Most commonly this protection is accomplished through acquisition and designation as parkland. However, other protection techniques such as Conservation Easements and Ecological Gifts have been utilized.

The City of Winnipeg is located in the heart of a unique natural ecosystem. Centered in the Red River valley on the east edge of the Prairies Ecozone, Winnipeg is home to a great diversity of naturally occurring plants and animals. It is this natural heritage that the character of our city was built upon and which helps to support our uniqueness and quality of life today.

Rotary Prairie Nature Park (*formerly Bradley Prairie*)

Once a street right of way, this land was being held for a future transportation corridor for a long period of time and was occasionally even mowed.

In the late 1980s, a renewed interest occurred in endangered Tall Grass Prairie. A local biologist checking areas in the city 'discovered' this unique piece of habitat on Regent Avenue in Transcona.

A development proposal brought the fate of this wet tall grass prairie to the forefront of the media. Residents and various groups banded together to preserve the site and prevent a major road being built in the area.

In 1992 this site was preserved because of the importance of its habitat. Transcona Rotary partnered with the City to help preserve, manage and enhance the site for visitors.

Photo : Naturalist Services, P.W.

A 2002 poll conducted by Western Opinion Research showed that Winnipeggers placed a high level of importance on the environment. In addition, residents also recognized that a healthy environment has a positive impact on the overall quality of life in the City. These findings were consistent with a Maclean's year-end poll conducted in the same year. The protection of ENSL is a key area of environmental responsibility for the City of Winnipeg, alongside issues such as urban forestry, waste management and public transit. In addition, the majority of Winnipeggers believe that we can protect our natural environment without harming our economy, and show a clear preference for innovative ways to fund environ-mental protection.

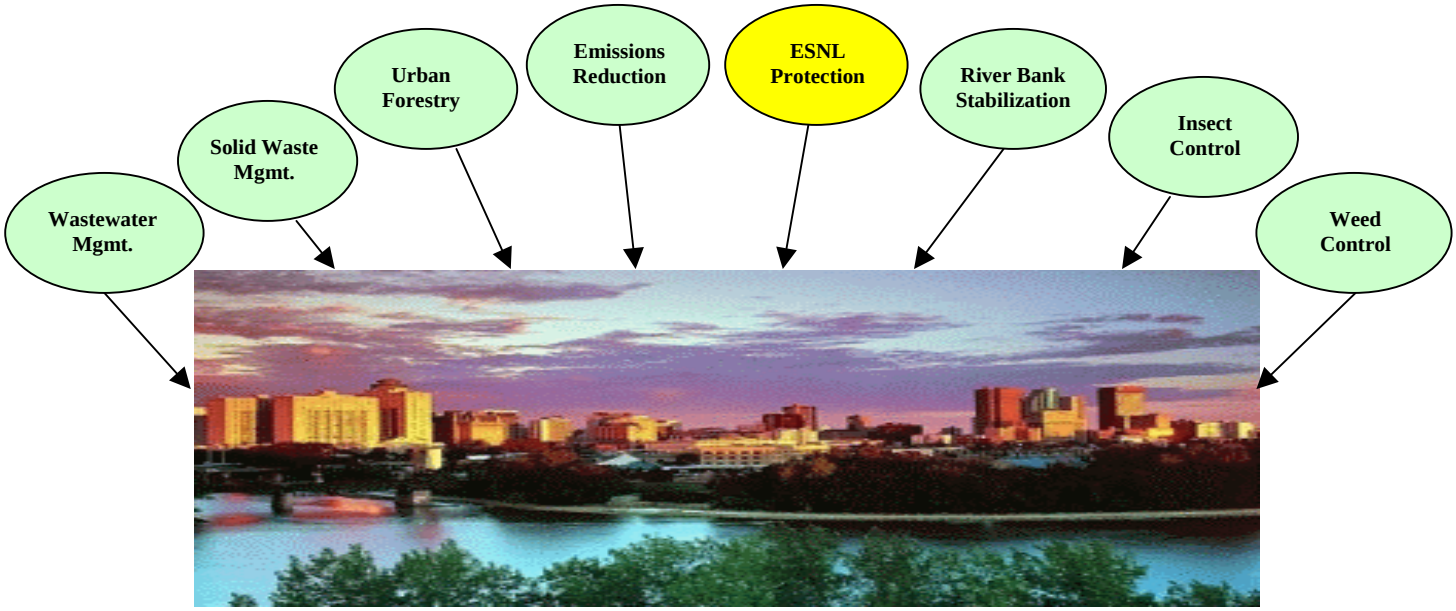
Photo:Ken McKim

1.2 Why do we need an ESNL Strategy?

The City of Winnipeg has committed itself to be a leader in protecting the environment and making the community a better place to live and work. That commitment has its foundation in a populace who cares and is reflected in a wide variety of ongoing environmental management activities as noted below.

- Wastewater Management
- Solid Waste Management
- Urban Forestry
- Weed Control
- Insect Control
- River Bank Stabilization
- Emissions Reduction, and
- The Identification, Assessment and Possible Protection of NA as ESNL

It is this last activity that is the subject of this strategy document. Why is the protection of NA important? What are our goals for the protection of NA? How do we assess the relative value of different examples of NA? When we have selected those lands most important to protect, how do we accomplish the needed protection? This strategy document answers those questions. It provides a logical and defensible procedure for the identification, assessment and protection of NA as ESNL.



2. ENVIRONMENTAL MANAGEMENT – CITY OF WINNIPEG

2.1 The Vision for ESNL in Winnipeg

The City of Winnipeg will be a city which has protected important pockets of natural flora and fauna representative of the original natural ecosystems and lands susceptible to damage from flooding or erosion for the enrichment of the quality of life of the citizens of Winnipeg.

2.2 The Reasons for ESNL Protection

2.2.1 ESNL can preserve heritage remnants

As the natural or cultural elements of our increasingly developed urban landscape become more and more rare, their retention as healthy natural elements or intact cultural elements increases in importance. A sense of place is important to the well-being of people and access to healthy landscapes and connection to important cultural and historical places and events go a long way to providing this sense of place.

2.2.2 ESNL can define character of the city or its neighbourhoods

Although the variations in our landscapes in Winnipeg are subtle, the differences can be important in defining a neighbourhood whether linked to a nearby river bottom forest, a healthy riparian environment, a natural prairie or some specimens of heritage trees with nesting eagles. Such natural amenities can provide some of the definition of community in an urban setting.

2.2.3 ESNL protection can support our economy

The economic importance of ESNL is wide reaching. It is often difficult to put an actual monetary value on a piece of this land as its modifying effects are felt far beyond its borders. These modifying effects can include protection against erosion along riverbanks, recharging of groundwater or helping to purify the air we breathe. The difficulty in quantifying these effects does not diminish their importance. Some of theses beneficial effects are referred to as being derived from natural capital. Natural capital consists of natural resources, environmental and ecosystem resources, and land. It is capital in the sense that these resources are assets that yield goods and services over time – goods and services that are essential to the sustained health of our environment and the economy. Protection and enhancement of natural capital will improve water quality and decrease water treatment costs, increase recreational opportunities, mitigate flooding, decrease net greenhouse gas emissions, lower dredging costs of waterways, improve air quality, provide habitat, sustain food production and produce many more tangible and intangible benefits to society.

It is also difficult to quantify the value that these areas have in attracting individuals to settle or move businesses to Winnipeg. ESNL are often attractive areas tied closely to quality of life in the urban setting. In addition, the presence of these ESNL also has a direct impact on the city's ability to attract tourists and therefore impacts revenues from tourism.

2.2.4 *ESNL protection promotes health, recreation and community*

The social importance of these areas can be recognized through the large number of community groups that work to protect or restore these lands. ESNL provide areas for recreational activities and provide an opportunity for anyone from the community to experience a little bit of wilderness in an urban area. Mountain bikers, joggers, pedestrians and birdwatchers use numerous trails running through these natural areas. This has a very healthy social impact, as people who meet on one of these trails are more likely to exchange a greeting than those who meet on a sidewalk. These areas also help to promote quality of life and good health through recreational exercise.

Also of social importance is the natural heritage of these areas. From an educational standpoint these areas promote learning more about our environment, the species that live in it and their interactions. Also, from an historical standpoint, these areas connect us to our past. They are living museums representing some of the wildlife communities that would have existed when the first people came to the site of Winnipeg.

From a health perspective the abundant vegetation in these areas helps to filter the air so that we can breathe cleaner air. The vegetation also has a moderating effect on the temperature helping it to stay cooler in summer and warmer in winter. Stands of vegetation also help to buffer a community against traffic noise and other disturbances.

Living Prairie Museum
(First prairie preserve)

The Tall Grass Prairie Ecosystem once covered the Red River valley and stretched all the way south to Texas. In Manitoba only 1/20th of 1% of the original Tall Grass Prairie remains. The Living Prairie Museum is one of the few remaining remnants of this once vast ecosystem.

In 1968 the International Biological Program (an international organization dedicated to the identification and preservation of rare biological communities) sent researchers around Manitoba looking for good examples of Tall Grass Prairie. Of the 64 sites examined, four were chosen for closer scrutiny. Of these four the Living Prairie Museum site was one of the best examples of Tall Grass Prairie in this province. Local naturalists and environmentalists spent effort and energy advocating for preservation of a portion of this 150 acre site and in 1971 the site was officially set aside.

The Living Prairie Museum, its uniqueness finally recognized and preserved, has been enjoyed by visitors of all ages. Many schools have taken advantage of the educational properties of this site when dealing with such aspects as the identification and enjoyment of native prairie plants and animals. It has also helped increase awareness of the historical settlement and cultivation of the prairie.

The benefits to be reaped from the endangered Tall Grass Prairie at the Living Prairie Museum by this and future generations are immeasurable, and for this reason great effort should be made to protect, preserve and learn from it.

2.2.5 ESNL protection can provide value-added environmental benefits

Trees have the potential to act as a carbon sink and to help offset the City's emissions. Ensuring the health and well-being of our natural lands will help to provide a healthy tree population, which will continue to absorb a portion of the greenhouse gases emitted by the City's operations. This will help to balance the City's impact on our climate, as on average, 110 trees will sequester 1 tonne of CO_2 per year.

2.2.6 ESNL protection allows the City to meet some of its responsibility for sustainability

Healthy riparian areas, forests and green spaces act as filters and buffers. Our air quality is improved by the forests. Our water quality is improved by the filtering of contaminated run-off en route to the receiving water body. All green spaces reduce the damaging peak run-off events through their ability to intercept and absorb rainfall.

2.2.7 ESNL protection promotes sustainability in the eyes of the public

There is increasing pressure on governments at all levels to do their part towards the achievement of sustainability. One visible way the City can do this is through the protection of ESNL.

2.2.8 ESNL protection provides connectivity from a human use perspective

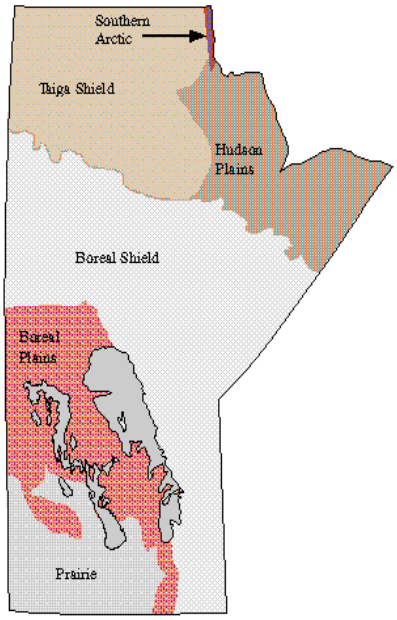
Corridors of greenways provide alternative methods for travel throughout the city. By utilizing continuous trails through these natural areas it can be possible to travel from home to work by bike without having to share a roadway with automobiles.

3. WINNIPEG'S NATURAL AND CULTURAL/HISTORICAL SETTING

3.1 The Natural Setting

The landscape around Winnipeg is influenced by climate, topography, time and more recently humans. These factors play the major role in what plants and animals call Winnipeg home, and what communities (habitat types) they form.

Winnipeg is located in the Tall Grass Prairie portion of the Prairies Ecozone. The Prairies are an area that is dominated by grasses and herbaceous plants. The Tall Grass Prairie is dominated by taller species of grass such as big bluestem. Forest types such as Aspen Forest, Oak Forest and Riverbottom Forest are also common around Winnipeg. The rivers which run through Winnipeg have helped to shape the landscape and influence the plants and animals that live here. Winnipeg is found within the Red River Valley where the Assiniboine River flows into the Red. The Red River Valley has a finely textured rich black soil, also known as Chernozemic soil, which is mainly composed of Red River clay sediment deposit. Although the landscape has fairly good surface drainage it has slow internal drainage that creates random small depressional wetlands such as sloughs, ponds and marshes. The soil is high in organic matter from the plant litter created each year from the prairie grasses covering the land. This combined with the soil's good moisture holding capacity gives it high productivity for agriculture.



EcoZones of Manitoba

Climate is one of the major influences affecting the natural communities in Winnipeg and the surrounding area. Winnipeg has a continental climate with cold winters and hot summers. The temperatures in winter average -10.5 ^{o}C while the average for summer is 15 ^{o}C. Extreme high temperatures of 40 ^{o}C and lows of -45 ^{o}C are possible. Precipitation averages 514 mm. The effect of this climate means that plants and animals must be adapted to high and low temperature extremes, and must be able to survive in adverse conditions. The precipitation is higher than many other areas further west in the Prairies Ecozone. These higher levels of precipitation are what makes it possible for the species of the Tall Grass Prairie to survive here.

Dominant tall grasses such as big bluestem and spear grass, and a colourful array of wildflowers such as aster, goldenrod, prairie crocus and lady's-slipper all survive in the Tall Grass Prairie. Native plant species have extensive root systems to assist them in reaching water and nutrients within the soil. These root systems can survive for many years, each year sending forth their new growth above the ground in spring.

The plant communities also have a dramatic effect on animal species present in the area. In the past bison, antelope, mule deer, grizzly bears and wolves were all common around the area that has become Winnipeg. As the landscape has changed these animals are no longer found wandering the plains around Winnipeg. With the spread of agriculture into the region and the restriction on prairie wild fires there has been an increase in the small tree bluffs located around the area. This transition has made it an ideal habitat for species such as whitetail deer that once only lived farther to the southeast. However, some of the smaller animals from the Tall Grass Prairie can still be found around Winnipeg. There are Richardson's ground squirrel, white-tailed jackrabbit, red fox and woodchucks just to name a few. Some bird species include a variety of hawks such as ferruginous and Swainson's, owls such as great horned and screech and other migratory waterfowl such as Canada geese and mallards.

Assiniboine Forest
(Sustaining natural areas through partnerships)

It's unusual to find a forest within a city, but Winnipeg has one – the Assiniboine Park Forest. Comprised of over 700 acres of predominantly aspen-oak forest, the Forest contains two wetland areas and over 11 acres of endangered tall grass prairie habitat, making it home for a variety of wildlife species. With over 10 km of multi-use trails, the Forest is also the ideal location for a variety of educational and recreational activities, providing unique learning experiences and a quiet place to escape the city to relax and enjoy nature. As Winnipeg's largest natural area, the Forest has become an integral part of the Charleswood community and the greater City of Winnipeg.

Although originally slated for development, the Forest was declared a Winnipeg Nature Park in 1974, and is now being protected and preserved by the City of Winnipeg with support from local schools and stewardship groups. In 1991, a partnership was established between the City of Winnipeg's Naturalist Services Branch and the Charleswood Rotary Club. As the "Keepers of the Assiniboine Forest", the Rotary Club has since committed both financial and human resources toward the custodianship of Assiniboine Forest with the technical guidance and support of the Naturalist's Office.

To date, several successful projects have been undertaken in the Forest as a result of this partnership. These have included: creation of the wood-chip trail system and a self-guided nature trail, installation of interpretative signage and notice boards, production of a Forest Education Package, and annual sponsorship of a team of 4-6 summer students to act as Forest Stewards removing invasive plant species and maintaining trails. Recent and very successful projects include the construction of a boardwalk over Eve Werier pond, the restoration of a former landfill site in the Forest to native tall grass prairie, and the development of the Forest's second wetland area.

Photo: Naturalist Services

3.2 The Cultural/Historical Setting

Human contact with the area now known as Winnipeg dates back thousands of years- the confluence of the Red and Assiniboine rivers creating a natural meeting place for seasonal gatherings of Aboriginal peoples who set up camps for hunting, fishing and gathering, trading, the reestablishment of family and linguistic ties and for celebrations. European contact began after the 1670 founding of the Hudson's Bay Company (HBC) although it wasn't until the 1730s that a trading post was established in present-day Winnipeg. This post and the several others located in the area were small, primitive structures not intended to foster permanent occupation of the land. What this European - Aboriginal contact did foster, however, was a new cultural group, the Métis, who took aspects of both traditions to create a new and unique society in North America.

This all changed with the arrival in 1812 of the first of several groups of settlers, sent by controlling HBC shareholder Lord Selkirk to create Western Canada's first permanent agrarian settlement. The group was comprised of displaced Scottish farmers (although in their numbers were also Irish, English, Swiss and German settlers). The settlement was laid out north of present-day Point Douglas; the original 24 river lots running from the north end of St. John's Park to approximately the south end of Kildonan Park. On the thin strips of land surveyed back two miles from the river these early settlers overcame floods, grasshopper infestations and the animosity of area traders and Métis hunters to flourish.

Growth of the area was slow, partially because the activities of farming and fur trading/hunting were not compatible in terms of land use and partially because of the isolation of the settlement. The former was solved by the severe reduction in numbers of fur-bearing animals in the region, forcing the local population to adopt a more sedentary, agriculture-based lifestyle. The isolation was initially lessened by the arrival of the Anson Northup in 1859, the first steamboat to make the trip north from Minnesota. Other ships followed and the community, which had become known as the Red River Settlement, began to expand. In 1873 with a population of fewer than 1,900 people, the community was incorporated as the City of Winnipeg, the capital of the new province of Manitoba.

It was the coming of steam railways, first from St. Paul, Minnesota in 1878 and then from Eastern Canada beginning on July 1st, 1886, that created the modern City of Winnipeg. With a permanent, year-round link, the entire region established an agriculturally based economy with Winnipeg as its premier city. From 1900-1915, this wheat economy was responsible for making the city the fastest growing urban centre in the world and Winnipeg's population burgeoned as thousands of Canadians, mostly from Ontario, arrived to work and live in the city. Large numbers of immigrants also arrived during this period, first settling north of the Canadian Pacific Railway tracks and creating Winnipeg's famous North End – a unique and ethnically diverse area filled with small homes, churches, clubs and shops. These groups succeeding in making a new home for themselves and became important contributors to life in modern Winnipeg.

Unique heritage tree at Little Mountain Park planted circa 1890

4. THE ESNL PROCESS:

4.1. Step One - Identification and Assessment of NA

4.1.1 The Inventory Process

The inventory is the foundation of the ESNL process as it is the mechanism for identifying the list of natural areas, which are then assessed for the need for protection and management actions. Since 2000, the City of Winnipeg Naturalist Services Branch has continued to conduct assessments and maintain the inventory. Maps of natural areas have been added to the City's GIS inventory and are updated on an ongoing basis as changes occur. A database of assessment information has also been created and is currently in use to manage inventory information.

The basic identification of these natural areas comes from aerial photos, field survey, inter-departmental request or public notification. Once a site is selected as a possible natural area it is ground-truthed using a method known as the Preliminary Habitat Assessment/Evaluation of Natural Areas. This method, developed in the 1980s and currently in use by the Manitoba Conservation Data Centre, allows the surveyor to rate characteristics of the natural habitat. The final outcome of this method is a habitat grade of A, B, C, or D, "A" being the highest and "D" being the lowest grade for natural habitat. Inventories, both past and present, have been conducted on City owned land and on lands for which landowner permission was previously acquired.

There are five basic categories used for natural habitat types within the City of Winnipeg: Riverbottom Forest, Tall Grass Prairie, Aspen Forest, Oak Forest, and Wetlands (See Appendix A for detailed descriptions). All these habitat types except for aspen forest are considered at risk according to federal and international authorities such as the Canadian Wildlife Service or World Wildlife Fund.

Once a site is graded in terms of habitat type and quality, the scarcity factor of the habitat type is added to determine how at risk the landform is. A slightly disturbed natural habitat which is endan-gered or at risk such as an oak forest would be a significant factor when assessing if the natural habitat should be protected as an ESNL.

History of the Inventory

In 1993 a partnership between the Canadian Wildlife Service, Manitoba Naturalists Society and City of Winnipeg Naturalist's Office created the first inventory of Natural Areas in Winnipeg. This inventory contained only a portion of the natural areas in Winnipeg and was followed by a more detailed assessment of these areas and the Seine River Parkway in 1995.

The Critical Wildlife Habitat Program followed by the Manitoba Habitat Heritage Corporation joined with the inventory partners to form the Capital Region Habitat Steering Committee. This committee produced the first website on the Natural Areas Inventory and additional habitat inventories were undertaken in the Capital Region surrounding Winnipeg.

The Naturalist Services Branch working co-operatively with the Land Based Information Systems produced digital layers of inventory and its database which is accesible today through iView.

Many natural lands hold a value specific to that particular area. The natural heritage assessment and grade for the site captures the most obvious and observable value of the

site. However, there are some features beyond that which can be captured in the natural heritage assessment. Consideration of the importance of any natural area must take into account the natural heritage grade as well as other features of the site.

The grade of the site refers to its natural heritage value. Sites receiving grades of B or higher are considered to be good quality sites and worthy of consideration for preservation based on that assessment alone. An A or B quality site is considered to have a plant community reflecting the natural heritage of the area around Winnipeg. The significance of this natural heritage must then be weighed against the habitat type of the site. In real terms this means that an A quality prairie site would be considered more significant and valuable than an A quality aspen forest simply because prairie is endangered and aspen forest is not. The grade for the site however would remain A for each site because they would both be of the highest quality for that type of plant community.

The grade B/C reflects a site that has some good characteristics and should be considered for preservation and possibly naturalization. However, the natural heritage assessment alone is not necessarily significant enough to be the only factor when considering one of these sites. The site can be considered significant enough for preservation but only on the basis of the natural heritage assessment in conjunction with any combination of other factors.

Sites receiving grade C or lower can only be considered for preservation based on other factors than the natural heritage assessment. If these areas are to be included based on other factors and the intention is that they function as natural areas they should be considered naturalization areas.

Sturgeon Creek
(Naturalization)

For centuries Sturgeon Creek has carried runoff from the uplands down to the Assiniboine River. In times past it would have been home to a great variety of wildlife with a rich diverse ecosystem. This richness and diversity began to disappear as the city and agricultural practices modified the creek banks and channel. Before the 1990s, sections of the creek had been straightened and the banks were mowed to the waters edge.

In the past 15 years the City has created no-mow zones along this creek to allow natural vegetation to regenerate along its banks. With the help of the local stewardship group, trees have also been planted to speed up the bank recovery into a natural river edge. Stone 'riffles' have been carefully added to the creek between Woodhaven and Hamilton to improve water quality and fish habitat.

These steps are important to creek recovery and reflect the importance of protecting significant natural areas. Long time residents in the area have reported that fireflies, which once lit up June evenings of the past, have now returned to Sturgeon Creek.

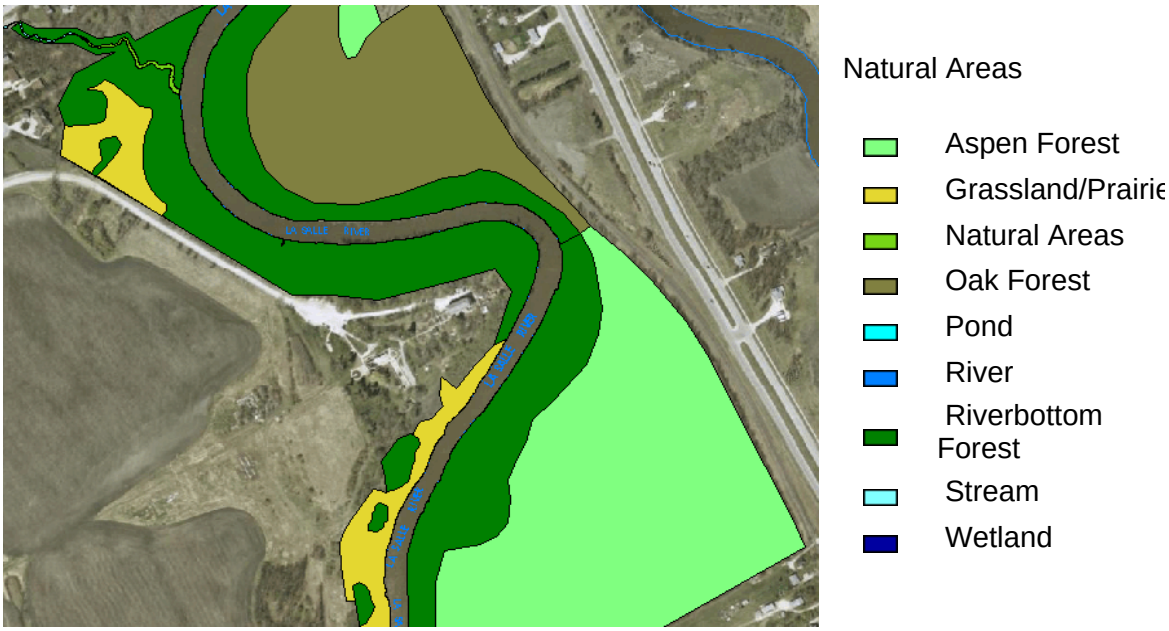
It should be noted that specific natural heritage features such as the presence of large or old trees, rare species, unique physical characteristics or other biotic and abiotic features may not by themselves cause the grade of a site to change. These individual features should then be considered as other factors that may make the site significant in terms of its natural heritage and value as ESNL.

Significant cultural value can be considered as other factors when determining the overall importance of a site. Though the value of natural heritage is in and of itself significant in terms of cultural value additional cultural features may be considered when determining the importance of a particular area. These cultural features can be a variety of things including historic sites and sites of special or unique importance to the surrounding community.

Connectivity or corridors between natural areas is of great importance for wildlife which inhabit these areas, for the overall functioning of the area and for recreational use. The functioning of an area as a natural corridor or connection between larger areas can be considered as an additional factor when judging the overall importance of an area.

4.1.2 Managing the Inventory and Completing Future Assessments

The inventory of natural areas must be kept current and constantly updated to reflect changes both natural and human caused. Keeping the inventory current will mean managing and maintaining the existing inventory and completing future assessments of natural areas as required for maintaining the inventory and as they relate to development proposals.



Inventory maintained and managed by Naturalist Services

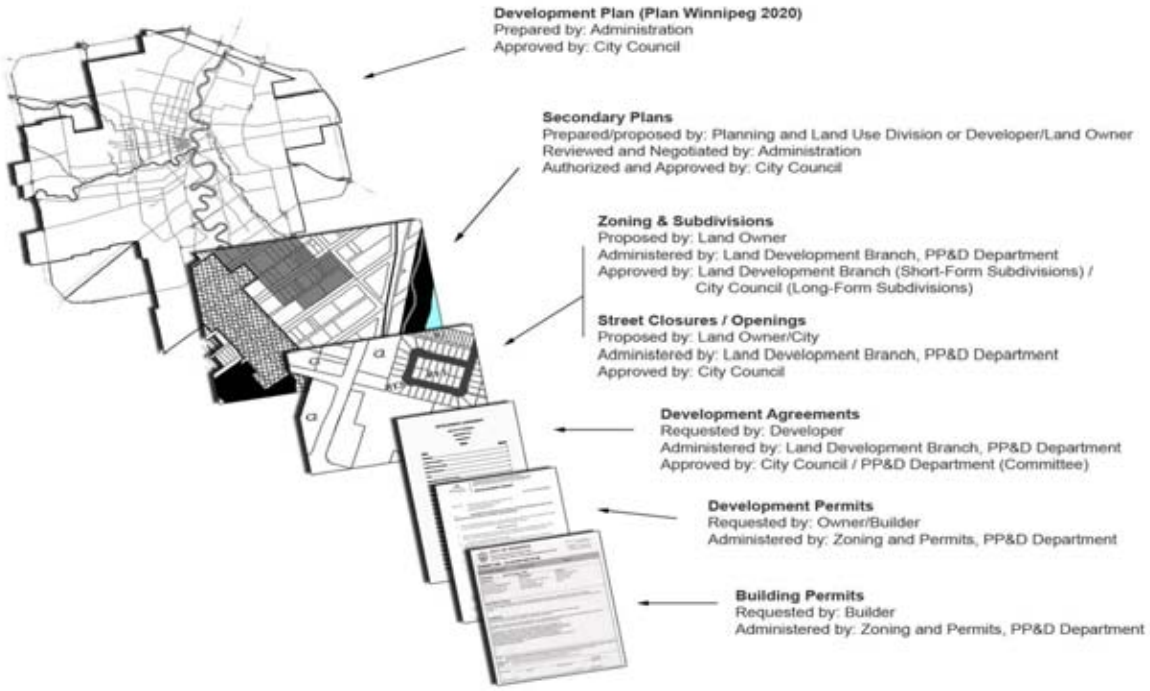
The inventory of natural areas is managed and updated by the Naturalist Services Branch. The entire inventory will be available to the public by request only. Information about inventoried sites found on city-owned land will be made available on the City of Winnipeg web site.

Any time a property under review in the planning process has the possibility of NA being present on it there should be a review of any current NA information for that property. If the property has not been assessed in the past and is not included in the inventory it should then be assessed through the natural heritage assessment process and determination of its importance as NA. The planning process will not be considered complete until this assessment has been completed and the determination of NA value made.

4.2 Step Two - Planning for ESNL

4.2.1 Secondary Plans

A Secondary Plan is a statutory tool that provides a more detailed level of direction for development than is outlined in Plan Winnipeg. It is intended to ensure efficient and orderly development of lands within a defined geographic area. The presence of NA are one of the items that are reviewed during the secondary planning process.



A Secondary Plan includes a statement of the City's policies and proposals for development, redevelopment or improvement. All land development within the defined geographic area must conform to this plan. In general terms, a Secondary Plan incorporates policy direction on desired land use concepts and related transportation network, municipal service delivery, open space requirements, and possible protection of NA for a specific area of the City. There are four types of secondary plans in Winnipeg:

1. *Area Structure Plan:*
   a secondary plan for an undeveloped or emerging neighbourhood.

2. *Neighbourhood Area Structure Plan:*
   applies to a defined portion of a broader Area Structure Plan area.

3. *Area Redevelopment Plan:*
   a secondary plan for a defined geographic area within an existing neighbourhood. Policy direction in this instance is given to support/direct the redevelopment of that area from a previously defined function or scope to another.

4. *Neighbourhood Plan:*
   a secondary plan typically prepared to provide policy direction for improvements to a defined area within an existing neighbourhood.

4.2.2 The Development Review Process (Subdivisions, Rezoning, etc.)

Once a parcel enters the development review process a number of steps occur as it relates to NA. This process is coordinated by Planning, Property and Development's Strategic Parks Planner with expertise and technical support provided by the Naturalist Services Branch, Public Works.

1. The area is compared to the NA Inventory to determine if a NA exists on the property. If the existing information requires updating a natural heritage assessment will be conducted.
2. Using Multi Criteria Evaluation, the natural area is reviewed by an interdepartmental committee to make a recommendation on whether the area should be recommended for protection as a designated ESNL.
3. If the site is deemed worthy of protection all possible options are considered in cooperation with the developer of the land.

The primary basis for designating lands as ESNL is the natural heritage assessment described in the previous section. However, there are many other factors which may also be used to determine the importance of an area. While not all natural areas are considered ESNL, all riverbank areas proposed for development shall be strongly considered for protection as ESNL irrespective of their natural heritage grade. Riverbank areas are extremely important for aesthetics, erosion control, water quality, aquatic and terrestrial habitat, corridors, greenways and maintaining ecosystem health. They are therefore always considered ESNL. The multi-criteria evaluation process encompasses this and other factors.

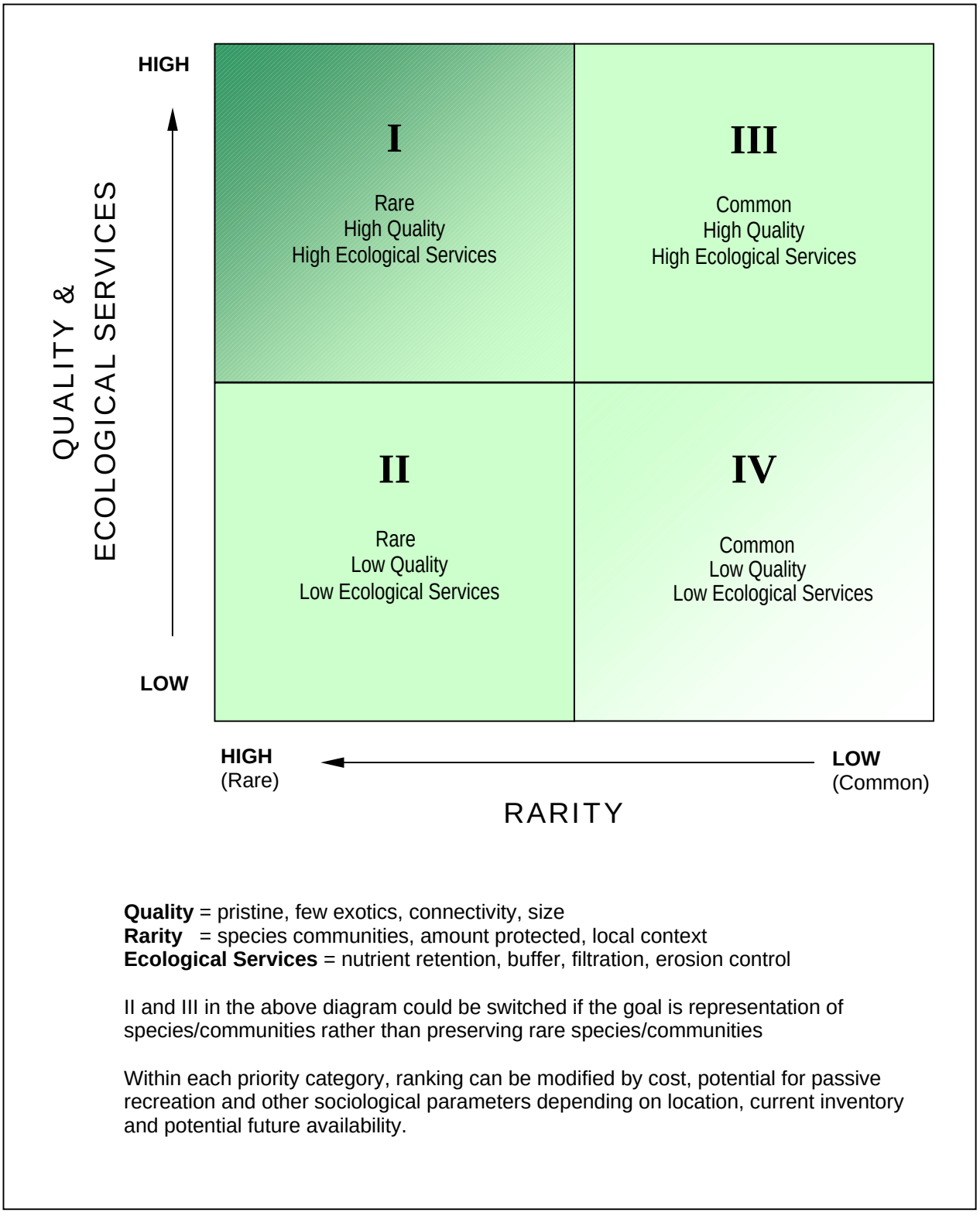
4.2.3 The Multi-Criteria Evaluation Process

The multi-criteria evaluation process employs the model portrayed in Figure 1, on the following page. The process begins with the ESNL categorized as A, B, C or D as described in the previous section. Each of these parcels is then assessed on the basis of rarity, quality and ecological services provided to place them in one of the four quadrants of the diagram - I, II, II or IV. This effectively provides a priority rating for the parcel.

Figure 2 lists the criteria used in the priority-setting analysis under the categories of rarity, quality and ecological services.

The following table lists the criteria used in analyzing each parcel to assess its priority for protection. In addition to the categories of rarity, quality and ecological services, another category is listed as "Human Interaction". This last category is shaded in the table to reflect that it is not fundamental to the initial priority-setting for protection but is rather an overlay which occurs following initial priority-setting. That overlay then assists in determining which of the high priority parcels can most productively and efficiently receive protection.

TABLE 1 - MULTI-CRITERIA EVALUATION MATRIX



Quality = pristine, few exotics, connectivity, size
Rarity = species communities, amount protected, local context
Ecological Services = nutrient retention, buffer, filtration, erosion control

II and III in the above diagram could be switched if the goal is representation of species/communities rather than preserving rare species/communities

Within each priority category, ranking can be modified by cost, potential for passive recreation and other sociological parameters depending on location, current inventory and potential future availability.

TABLE – THE APPLICATION OF THE CRITERIA TO THE PRIORITY-SETTING MODEL

CATEGORY OF CRITERIA	CRITERIA	FIT WITH REASONS FOR PROTECTION (pp 3,4 & 5)
Quality	• Habitat ranking • Size of area • Current condition • Presence of exotics or invasives • Existence of unique ecological features • Importance as staging area or migration corridor • Connectivity for plants; animal corridor • Riparian zone	• Heritage remnants • Responsibility for sustainability • Promotes sustainability
Rarity	• Presence of S1 – S3 species • Amount that is already protected • Deficit or surplus in each area	• Heritage remnants • Responsibility for sustainability • Promotes sustainability
Ecological Services	• Carbon sequestration potential • Oxygen production potential • Stormwater retention potential • Influence on micro-climate • Contribute to nutrient retention; contributes to water quality • Contribute to riverbank stability & erosion control	• Environmental benefits • Responsibility for sustainability • Promotes sustainability
Human Interaction	• Difficulty of acquisition • Cost to improve or maintain • Effects on value of adjacent properties	• Support economy
	• Value for passive recreation • Relative ease of access • Citizen organization to maintain • Buffer between competing land uses	• Health, recreation and community • Human use connectivity
	• Size of individual tree • Who planted the tree • Value for passive recreation • Existence of cultural value • Sense of place • Relative ease of access	• Heritage remnants • Defines character • Health, recreation and community • Human use connectivity

4.2.4 Implications for Zoning and Future Land-use

ESNL acquired by the City of Winnipeg shall be zoned PR1 and follow acceptable management procedures as stated in this Strategy. ESNL managed on private land though conservation agreements or already otherwise zoned on City of Winnipeg land shall not be rezoned unless agreement is made to transfer the land to Parks.

Future land use shall follow guidelines set out by the Zoning By-Law, management practices stated in this Strategy and guidelines laid down by any conservation agreement that may be put in place.

4.3. Step Three – The Protection of ESNL

4.3.1 Private Landowners as Stewards of our Natural Heritage

While most ESNL in Winnipeg is found on public land, private landowners make up the majority of the land base in Winnipeg. Private landowners are in an important position to be valuable stewards of our natural heritage. A considerable amount of valuable natural lands is found on private land and has been preserved on private lands for many years. There are many reasons why these natural lands have not been destroyed. In some cases landowners have seen the value of these natural lands or enjoy their presence and have taken an active role in their stewardship. In other cases these lands have simply been left in their natural state due to economics or convenience. In any case the value of these natural lands should be realized for their economic, social and environmental value.

Where possible the City should encourage and provide incentives for private landowners to act as stewards of the natural lands on their property. Private landowners should be seen as partners in stewardship and preservation of these lands for the future.

4.3.2 Incentives and Rewards for Protection of Natural Areas

There are a number of programs and tools present by which landowners can benefit from the presence of natural areas on their land.

1. Conservation Easements

   Conservation easements are legal agreements voluntarily placed on the deed of property by the landowner to protect natural features. The easement can be placed on the entire property or on a portion of the property and can be set up to continue once ownership of the property is transferred. The easement restrictions can be used to protect existing natural areas on private property without a transfer of ownership. Under the provision of the Province's *Conservation Agreements Act* landowners may sell or donate an interest in the land to an eligible conservation agency for the purpose of preserving a portion of the land for the enhancement of natural ecosystems, wildlife or fisheries habitat and plant or animal species. The benefit to the landowner can come through tax deductions for the easement and/or payments by the conservation agency.

2. Charitable Donation

   The Canadian Ecological Gifts program is provided by the federal government as a way for landowners to donate ecologically sensitive land to qualified recipients in return for significant tax benefits. For the purpose of this program a wide range of natural ecologically sensitive lands can qualify and would include most NA. Ecological gifts can be outright donations of land or certain conservation easements. In order for the gift to qualify for the program ownership of the property must be transferred to a qualified recipient, the transfer must be voluntary and no benefit can be provided to the donor or person selected by the donor. The qualified recipient can include federal, provincial, territorial and municipal governments or charitable organizations with protection of Canada's environmental heritage in their mandate.

4.3.3 Acquisition of Natural Areas

In some cases the most effective way to preserve ESNL may be outright purchase of the property by the City or transfer of ownership to the City in return for other compensation such as a land trade.

1. Outright Purchase

   Outright purchase of the property containing ESNL may be considered when other options do not appear viable and in cases when it appears to be the best option.

2. Land Exchange

   Property trading may be an option in certain cases. A trade-off would involve agreement of the landowner with ESNL on their property trading that property to the City in return for another property. A property trade would only be used in cases where the trade is considered acceptable or beneficial to both parties.

3. Land Dedication

   Under the authority of The City of Winnipeg Charter (Section 259(1)) Council may make the approval of a proposed plan of subdivision subject to either of the following conditions: That at least 10% of the land be dedicated to the City for purposes park. That instead of setting the condition above, money be paid to the city for the purchase of land for the purposes of park.

   The Development Agreement Parameters state that developers shall dedicate a minimum of 8% of the net area of any proposed development for public park purposes and pay the remaining 2% in cash so that the dedicated lands can be graded and sodded. If land is not required for public park purposes, the Developer shall provide a cash payment representing 10% of the appraised value of the Development Application.

   Natural areas that are identified as important to protect as ESNL can be dedicated through the land dedication process.

4.4 Step Four - Managing ESNL

4.4.1 Management of the Designated ESNL

The City of Winnipeg, Parks and Open Spaces Division, shall make management decisions for ESNL located on City owned land. It will be the responsibility of the City of Winnipeg to ensure that these areas are managed according to practices stated in this Strategy. Community based stewardship groups may also take part in the management of these areas on the basis of agreement with the City of Winnipeg.

Management of ESNL on private land shall be the responsibility of the landowner unless a conservation agreement is in place allowing management by another organization. Conservation agreements for management of ESNL should follow practices as stated in this Strategy or should be otherwise acceptable management practices for preserving or restoring natural lands.

4.4.2 Regulations for Land-use

Land designated as ESNL and under agreement for preservation shall be managed in such a way as to protect the natural heritage of the site.

4.4.3 Natural Areas on Public Land

ESNL on public land shall be inventoried and managed according to this Strategy. The City of Winnipeg will lead by example by preserving and restoring ESNL. The majority of ESNL in Winnipeg is found on City owned lands and it is the responsibility of the City to ensure protection of its natural heritage.

4.4.4 Natural Areas on Private Land

The City of Winnipeg does not designate NA as ESNL on private lands but will rather attempt to work in cooperation with landowners to protect NA using the tools outlined in Step Three.

Bois-Des-Esprits (Preservation)

A high quality river bottom forest with river bottom and oak forest is the last large forested area along the Seine River in Winnipeg. It has many unique features including some of the last existing oxbow wetlands in the city. Most of this forest has been graded as A quality.

In 2002 the forest was a part of a proposed new development. The local stewardship group, Save Our Seine River Inc., mobilized to raise awareness and implement a fund raising campaign to protect the forest. After a lot of work and struggle by both city and volunteers, the entire forest was purchased through unique joint funding by the Save Our Seine, the City of Winnipeg and the Province of Manitoba to be protected in its natural state. The forest is now a habitat showpiece along the Seine River.

4.4.5 Role of Stewardship Groups

Since 1992 over 80 community partners have invested thousands of volunteer hours and environmental grant funds in cleaning, weeding and planting Winnipeg's natural areas. The value of grants has an estimated value of about three quarters of a million dollars annually.

Stewardship groups are independent volunteer based organizations usually comprised of community residents that have an interest in the natural areas around their community. These groups put in countless hours of work restoring and maintaining natural areas around Winnipeg. The work of these groups is incredibly valuable to the environment of our city and continued support for these groups to follow the practices presented in this Strategy should be provided by the City.

Seine River Volunteers Clean-up

Technical advice, varying degrees of support and coordination for these groups is provided by Naturalist Services Branch and should be continued in the future.

4.4.5 Management Practices in Maintaining the Natural Heritage

The natural heritage of Winnipeg was formed over centuries of wildfires, floods and grazing by large ungulates such as bison into a balanced stable community of plants and animals. Since the formation of Winnipeg and the introduction of non-native plants and animals this balance has been lost in many cases and is being threatened in others. The stresses removed by the lack of wildfire and floods has caused many plant communities to begin changing towards species that are intolerant of those stressors while the species which were part of the original balance are in decline. The introduction of non-native weeds has also brought about stresses that have changed the natural balance of many natural heritage communities. Maintenance practices are therefore needed in order to preserve and maintain the natural heritage of Winnipeg and protect some of the original interesting species of plants and animals from completely vanishing. Many of these maintenance practices try to resemble in some way the historic stresses that would have been present in the past while others try to prevent new stresses brought by urbanization. (See Appendix 5)

1. Weed Control

   Non-native plants in natural areas can be placed into two categories: i) naturalized plants, which are species growing in natural areas in small groups that do not significantly displace or compete with the native flora, and ii) invasive plants, or species which thrive in natural areas and subsequently displace the native flora and decrease diversity. This latter group is of great concern, as they can have devastating effects on habitat quality and wildlife as well as human use and enjoyment of infested areas.

   Next to habitat destruction or conversion, non-native species are the most serious threat to natural areas and if not actively managed, natural areas can decrease in quality. Urban natural areas are highly susceptible to non-native species invasion, as they are fragmented and surrounded by degraded lands.

2. Controlling Non-native Plants

Management efforts need to be site-specific to ensure habitat quality is not compromised by weed control activities. In many cases, for successful removal or control, disturbance factors that allowed for invasion must be removed and natural areas must be restored to their original condition.

Common management methods include herbicide, physical removal, biological control, prescribed burning, and integrated pest management.


Controlled burn

Photo: Naturalist Services

3. Maintaining Habitat Integrity

A dramatic or gradual change in the physical features of the site will have an effect on habitat. The draining of a wetland will cause the wetland species to be replaced by upland species, the flooding of an oak forest due to build up of the surrounding land and drainage blockages will cause the oak trees to die and will usually open the forest for weeds to take hold. A remnant prairie which is no longer experiencing wildfires will begin to change in plant composition tending towards more woody species such as shrubs and trees.

A well rounded approach should be taken to maintain habitat integrity. Prevention is the first and most effective method for maintaining habitat integrity.

4. Prevention of Dumping and Removal of Trash

Dumping of trash including garden waste into a natural area is very detrimental to the area. While visually unappealing it also destroys the natural vegetation at the dumping site. The disturbance caused by dumping and the destruction of natural vegetation allows weeds to invade the natural area.

Removal of trash from dumping or other litter which has accumulated in the ESNL must be included in the maintenance practices of the site. The City is responsible for maintenance of public lands and should include removal of trash from ESNL within maintenance costs. Public participation in cleaning of these areas should also be sought through partner-ships with stewardship groups and community organizations.

Photo: Saveourseine.com

5. Making the Site a better place to visit

   Visitor traffic and appropriate or inappropriate uses of natural areas have an effect on site integrity. Several management techniques are used to guide visitor use into appropriate avenues.

   Public awareness and support are vital in the protection and preservation of natural areas. Interpretive signage and educational information such as pamphlets, newsletters and guided tours can be used to identify the importance of natural areas or species. Increased understanding and appreciation of natural areas can help prevent future habitat destruction or degradation.

   Trail development and interpretive signage help improve visitor experience as well as preventing soil disturbance, damage to vegetation and habitat fragmentation. Trails that are clearly delineated help guide visitors and contain site damage such as the introduction of exotic species, garbage and vandalism. Trails can provide access that avoids sensitive areas, significant species and areas of wildlife use, discouraging uncontrolled access and habitat disturbance.

6. Trail Construction and Maintenance

   Trails should be constructed in such a way that minimizes impact to natural features while providing an interesting and scenic route though the area. Construction practices should also avoid causing collateral damage to the ESNL. Trails should be built in such a way that they are accessible and usable for the majority of the year.

7. Signage, Promotional Materials

   Promoting natural areas and education through interpretive signs is essential for building an understanding of the importance of ESNL and particular features. Funding for signage of all high use areas or areas with special concern should be allocated in part through budget and sought from partners and other sources. Promotional materials can also include support for stewardship group newsletters and inclusion of ESNL related information in press releases and media resources.

APPENDIX 1

Identification and Assessment

APPENDIX 1 - Habitat and Plant Communities

Communities of plants and animals form within the bounds of the physical features of the site. Thus, a low lying site covered by water for most of the year will most likely have a community of wetland plants. Changing the physical features of the site such as filling the low lying area or adding drainage to the area to remove the water will cause the community of plants and animals to change. In our natural habitat these communities have often taken hundreds or even thousands of years to develop the natural balance and diversity of life that they have obtained. A sudden change in the physical characteristic of the site destroys this natural balance and normally leads to the introduction of large numbers of unwanted weed species.

The plant communities and habitat within Winnipeg have been generally broken down into five main categories based on the dominant vegetation present and mixture of species found within the area.

1. Prairie

Native prairie is dominated by a mixture of native perennial grasses and wildflowers with some low growing shrubs. Prairie grasslands are some of the richest plant communities in Manitoba. From early spring when the first crocuses emerge to catch the warmth of the sun, to the fall when the prairie grasses wave their golden stalks in the cooling breeze, the prairie is constantly changing. Most of Manitoba's endangered plants and wildlife are found in native prairie habitats.

Manitoba has two main types of prairie: tall-grass and mixed-grass prairie. Before the arrival of European settlers, the Red River Valley in south-central Manitoba was a sea of tall-grass prairie, a complex ecosystem with an astonishing variety of grasses, flowers and wildlife. Its name comes from its tall grasses that reached over two metres in height. In this area, the loamy or clay-based soils and more than 500 mm (20") of precipitation a year provided the ideal growing conditions for tall-grass prairie. It was the most productive type of prairie in North America. Today tall-grass prairie is one of the most endangered ecosystems in Canada and across North America. Less than 1% of Manitoba's tall-grass prairie remains.

Mixed-grass prairie lies to the west of the tall-grass prairie, where there is less precipitation (25-30 mm or 10-20" annually) and the soils are sandy or well-drained. The grasses here are mostly knee-high. Mixed-grass prairie extends from the Interlake and southwestern Manitoba across Saskatchewan to Alberta. While there is more mixed-grass prairie left in Manitoba, much of it is being degraded through overgrazing and the introduction of weeds. Weedy plants do not ordinarily occur in undisturbed prairie areas. Only when the prairie sod has been disturbed will weed species become established. The number and kind of weeds will depend on the degree and nature of the disturbance.

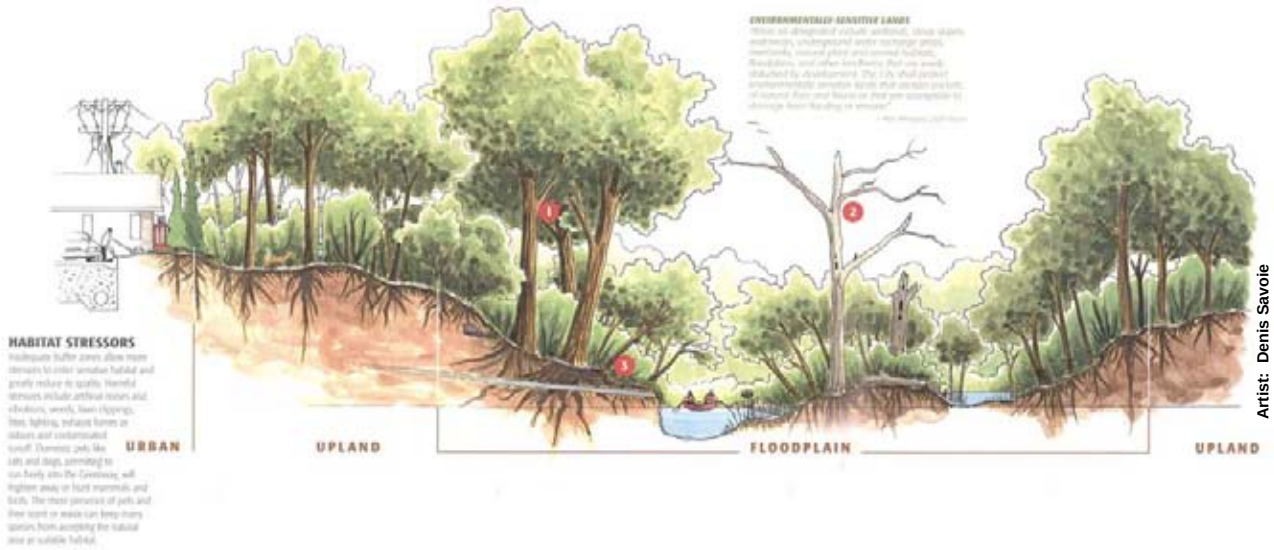
Photo: Naturalist Services, P.W.

Prairie plants have special adaptations to overcome extremes in temperature and moisture. Hairy or rolled leaves reduce moisture loss; deep spreading root systems take advantage of available moisture and can store great quantities of food. These types of adaptations are especially important in surviving the periods of drought that are characteristic of the prairies. Prairie animals are also specially suited for a grassland environment. The short-eared owl, meadowlark, and savannah sparrow are examples of prairie birds that nest right in the grass. Others, like the goldfinch and clay-coloured sparrow, are more at home in small shrubs. Prairie birds tend to sing their loud, clear songs from the air, rather than from perches, as forest birds do.

Because there are few trees, some prairie creatures make their homes in dens or underground burrows. Bumble bees, foxes, badgers, burrowing owls and some reptiles and amphibians spend part of their time underneath the prairie. Voles, mice and shrews make grass nests in the ground. Tawny colouration, plant-eating and burrowing habits, and an ability to survive drought are characteristics which help prairie animals to thrive in a flat, treeless environment.

2. Riverbottom Forest

Riverbottom forests grow along the edges of rivers and streams. They depend on the spring floods to deposit silt and replenish the soil with nutrients. In return, their roots stabilize stream and river banks, helping to reduce erosion. Riverbottom forests are very diverse habitats with a large number of plant species. This makes them attractive to many different wildlife species as they provide a variety of food and shelter, and are close to water. Habitats located along waterways are also called riparian habitats: riverbottom forest is one type of riparian habitat.



Riverbottom forests can generally be divided into three sections: the channel shelf or riverbank also known as the toe, the floodplain, and the terrace.

The riverbank is the gently sloping area right next to the edge of a river, stream or creek. This area of the riverbottom forest is dominated by trees, such as willow and cottonwood. Few shrub species dominate in the riverbank area because of yearly flooding and damage from spring ice breakup. Instead, this part of the forest has more grasses and annual wildflowers.

Above the riverbank is the relatively flat floodplain. This part of the forest is usually dominated by trees such as green ash, basswood, American elm, and Manitoba maple. The greatest variety of species is usually found on the floodplain. Here the plant community is dominated by flood-tolerant perennial species. Common shrub species include: American hazelnut, beaked hazelnut, downy arrowwood, and chokecherry. Many flowers and grasses, as well as woody and non-woody vines also exist in the floodplain.

The terrace lies above the floodplain, on the highest elevation within the riverbottom forest, farthest from the river. As this area is not flooded as often, this part of the forest is dominated by plants which prefer a drier habitat such as bur oak. Many of the plants found in the floodplain may also grow on the terrace.

3. Oak Forest

Oak forest habitat in Manitoba is made up of a canopy of bur oak trees with an understory of shrubs such as hazel, hawthorn, poison ivy, snowberry and wild rose. In Manitoba, oak forest dominates on very dry sites, including gravel ridges or the upper terrace within a riverbottom forest where flooding rarely occurs. Thick stands of pure oak are not common in Manitoba and their formation and maintenance was often related to wildfire. More often, bur oak trees are found in mixed stands with aspen. Most of the aspen forest habitat sites inventoried in Winnipeg also contain some oak trees. In the tall-grass prairie region of southern Manitoba, small stands of oak can be found mixed with openings of native prairie, creating a blend of plant communities sometimes referred to as "oak savannah".

4. Wetland

A wetland is a depression of land which contains water for all or most of the year. Prairie wetlands get their water from snow, rain, and groundwater. Wetlands can be large or small, shallow or deep. They can be filled with plants from one end to the other, or they can be open water with plants growing mostly around the edges. The different types of wetland which can be found in Winnipeg and the surrounding area include:

Swamps - a wetland dominated by trees or shrubs.
Marshes - a wetland frequently or continually filled with water, with plants that are adapted to growing in wet or saturated soils.
Potholes - shallow marsh-like ponds that may not hold water during periods of dry weather
Fens - a wetland with marsh-like vegetation that develops in an area of organic solids (peat) that receives some water draining from surrounding mineral soils
Bogs - a wetland dominated by mosses and conifer trees which develops in an area of organic soils (peat) and no inflows or outflows of water.

Within a wetland there can be a number of different zones, where habitat conditions vary, depending on the level of the water. A wet meadow is an area with wet soils but no open water. Plants growing here need more moisture than the drier prairie plants but do not like to be flooded for very long each year. The area called the emergent marsh occurs where the water is shallow around the edges of marshes and potholes. Plants living here are able to grow in standing water and are tall enough to emerge above the water to reach

the sunlight. If the water level in the wetland drops, the emergent marsh can become an exposed mudflat. If this area stays without water for some time, plants that do not like to be flooded will begin to grow here. An area of permanent open water can be found in some larger marshes and swamps. Plants growing in this deeper water may appear to be floating on the surface but most have stems and leaves that are submerged below the water.

5. Aspen Forest

Aspen forest habitat is the most common natural habitat remaining in Winnipeg and the surrounding region. It is dominated by nearly pure stands of trembling aspen, often with grassland openings. Where these grasslands are undisturbed, they still contain native tall-grass or mixed-grass prairie plants. Where these grasslands are in low-lying areas, they are home to wet meadow species or they may contain small wetlands. Aspen forest stands mixed with openings of native prairie are sometimes referred to as "aspen parkland". Aspen forest also may contain bur oak trees in dry areas and balsam poplar trees in low-lying, wet areas. Manitoba maple and green ash trees may also be present.

Sunlight passes easily through the canopy of the aspen forest, allowing a rich variety of shrubs, grasses and wildflowers to grow in its understory. Many of the shrubs provide food (seeds, berries or nuts) for wildlife. Red-osier dogwood is scattered through the aspen forest, particularly in moist locations. Roses, chokecherry, pin cherry and saskatoon occur on the edges of the aspen forest. Disturbed areas are often occupied by wild raspberry. White-tailed deer, red squirrels, eastern chipmunks, eastern cottontail rabbits and many birds all take refuge in aspen forest.

APPENDIX 2
Restoration of ESNL

APPENDIX 2 – Restoration Of Ecologically Significant Or Environmentally Sensitive Lands (Naturalization)

1. Priority Areas for Restoration

There are many situations which may lead to an area being considered a priority for restoration.

- Restoration to repair recent damage to all or part of a high quality natural heritage area where the long term effects of the damage can be eliminated or mitigated through restoration
- Mitigation of damage to any river bank ESNL or compensation work under Fisheries Act regulations
- Natural heritage restoration to low grade ESNL designated as such due to other factors including the restoration of connections and corridors
- Restoration of endangered ecosystems

2. Management of Restoration Projects

Restoration projects should be planned as sustainable projects that will exist long term and will gradually transition from higher maintenance restoration projects into self sustaining natural areas of high quality. Projects should be designed with a maintenance plan that will ensure the necessary resources are available to sustain maintenance activities until the natural area can be self-sustaining. Maintenance practices can include activities such as weed removal and watering of trees. Monitoring of restoration projects should also be conducted to determine success of methods used, colonization by volunteer species and modifications or additional treatments necessary.

Acceptable management practices need to be determined at a site specific level and can be funded through a variety of sources and partnerships.

3. Types of Restoration Projects

<u>Planting</u>

Planting of trees and/or seeding of native species is an active form of restoration that introduces the basis for a natural heritage plant community to a restoration site. Plant material used to restore natural heritage and ESNL sites should be native to Manitoba and more specifically to the region around Winnipeg. It should come primarily from a diversified genetic stock meaning that cultivars should be avoided where possible. The physical characteristics of the site should also be taken into account when selecting species to ensure survivability of the planting and long term sustainability of the restoration. Planting activities should attempt to model original (historic) plant communities or habitat types from Winnipeg and the surrounding ecodistrict. Planting should also follow acceptable planting procedures that will ensure survivability of the individual specimens planted and will allow for their success through future maintenance practices and self sustainability in the long term.


Photo: Naturalist Services


Photo: Naturalist Services

Bioengineering

Winnipeg's rivers and creeks are all subject to the potential for erosion or bank slumping and this potential is multiplied when significant vegetation is lacking along the riverbank. Bioengineering is used to help stabilize riverbanks through the use of vegetation with deep binding networks of root mass. Bioengineering is often combined with other engineering solutions to help ensure riverbank stability and flood protection. The combination of Bioengineering to help protect riverbanks while restoring ESNL and natural heritage is currently used on a regular basis and should continue to be used whenever possible on riverbank protection and flood-proofing projects.

Willow Posts – at installation

Willow Posts – after establishment

Riparian In-Stream Structures

Riparian structures are used to enhance the habitat within creeks and streams and to restore functions to the creek which may have been removed through channelization or other past disturbance. Riffle structures are the most common form of riparian structure used in the City of Winnipeg. These structures help to regulate water levels and flow while also introducing oxygen and habitat diversity into the stream. The fishway at Grant's Old Mill on Sturgeon Creek represents another type of structure used as an attempt to mediate the effects of the dam which blocks upstream passage of fish at this point. Riparian structures should continue to be supported and used where implementation is shown to be appropriate. Monitoring of these structures should be conducted on a regular basis to ensure that they are functioning properly and achieving their desired purpose.

Sturgeon Creek Riffle Structures

Reclamation of Heavily Disturbed Sites

Heavily disturbed sites include sites that require some form of remediation prior to restoration of ESNL or Natural Heritage. They can include brownfields, sites with high levels of trash and debris or other chemical or physical contamination. Where these sites occur on land representing ESNL attempts should be made at remediation. Following remediation these sites can be restored or naturalized to their appropriate habitat. Where possible and when deemed an effective practice naturalization can also be used as a process of remediation for these sites. The landfill in the southeast corner of Assiniboine Forest is an example of heavily disturbed site reclamation. Experimental tree plantings are occurring on two other former City landfills at this time.

Bio-salvage

In the case where areas of natural heritage that have significant plant communities or rare/significant species cannot be saved the City should pursue Bio-salvage wherever possible. Bio-salvage involves the moving of these living plants and organisms to new locations where they can survive and be preserved. When the decision is made to develop an area known to have significant natural heritage the possibility for bio-salvage from the area should be reviewed.

Bio-salvage can be conducted on many scales. It can include small scale inexpensive options such as digging up only a few plants for transplanting in a new location or it can include more expensive and large scale sod cutting to move and entire plant community to a new location. Decisions related to Bio-salvage should be made based on what can be successfully achieved and on cost for salvage operations.

An example of bio-salvage is the B quality tall grass prairie that once was found at Kenaston and McGillivray. When development was allowed on this site salvage operations were used to transplant portions of this prairie to degraded areas on Omands Creek just north of Bluestem Park and George Olive Nature Park in Transcona.

APPENDIX 3
Related City of Winnipeg Initiatives

APPENDIX 3 – Relationship to other City Initiatives

1. Trails and Pathways

Scenic trails wind their way through the natural areas of Winnipeg. Most parkways and major trail systems in Winnipeg exist within or are related to ESNL. Strategic planning of ESNL goes hand in hand with any initiatives related to the creation or maintenance of recreational trails throughout the city of Winnipeg.

2. Transportation

ESNL provide buffers both visually and in sound reduction between high traffic areas and residential areas. Strategic planning of corridors and connections of ESNL also allow for alternative methods of transportation such a bike trails separate from main traffic arteries. This strategy ties in closely with many ideas related to the Active Transportation Study.

3. Retention Ponds and Drainage

The use of naturalized retention ponds has been shown to greatly improve water quality directed through land drainage and the storm sewer system. This improvement in water quality is beneficial both to the residents living next to the retention pond and to those downstream. In addition to a general improvement in water quality the habitat for fish and other wildlife is greatly increased. ESNL are also important for overall buffering from excess precipitation events or drought. With most precipitation being quickly drained from built up areas ESNL often act as sinks for holding and distributing excess moisture. Maintaining natural wetland areas and meanders in streams helps to release water from runoff more slowly reducing erosion and maintaining a more stable ecosystem. In turn, by slowing the flow of water from wetland areas aquifer recharge is possible in selected areas.

4. Tree Protection

Much of the urban forest is found within ESNL. Tree protection as it relates to trees on public land is valid both in ESNL and for trees on boulevards and manicured areas.

5. Weed Control

Weed control is used within natural areas and naturalization areas on a site specific management plan basis. Thus, larger weed control strategies within the City are related to ESNL management plans.

6. Brownfields or Unused Landfills

The City of Winnipeg has approximately thirty-five old landfills which it inherited during the amalgamation of multiple municipalities into the current “Unicity’ City of Winnipeg structure in 1974.

While brownfields are considered environmentally sensitive, they differ dramatically from ecologically significant lands because they do not contain remnants of the original plant communities which occurred in the Winnipeg area pre-settlement. They are totally disturbed sites with a variety of debris and material in it some of which can be environmentally hazardous.

If the site has hazardous materials in it, the provincial Department of Conservation would be involved in ordering appropriate remediation. An example of this type of site is the former Domtar site in Transcona. This 96-acre site had contaminated material, was remediated and because of restoration and some existing natural areas is now a private natural area for residents of Transcona known as the Transcona Bio-reserve.

7. Riverbank Protection

Existing ESNL provide a natural buffer against riverbank erosion. Extensive root systems help to hold soil in place and slow the pace of bank slumping and erosion. Naturalization projects are also being utilized throughout the city in areas where previously existing vegetation no longer existed. In addition, engineered riverbank protection projects that have been deemed damaging to habitat under the federal Fisheries Act require compensation under no-net loss legislation. Naturalization projects to restore ESNL along riverbanks have been used throughout the city as compensation for these projects.

APPENDIX 4
Management of ESNL

APPENDIX 4 – Management Practices in Maintaining the Natural Heritage

The natural heritage of Winnipeg was formed over centuries of wildfires, floods and grazing by large ungulates such as bison into a balanced stable community of plants and animals. Since the formation of Winnipeg and the introduction of non-native plants and animals this balance has been lost in many cases and is being threatened in others. The stresses removed by the lack of wildfire and floods has caused many plant communities to begin changing towards species that are intolerant of those stressors while the species which were part of the original balance are in decline. The introduction of non-native weeds has also brought about stresses that have changed the natural balance of many natural heritage communities. Maintenance practices are therefore needed in order to preserve and maintain the natural heritage of Winnipeg and protect some of the original interesting species of plants and animals from completely vanishing. Many of these maintenance practices try to resemble in some way the historic stresses that would have been present in the past while others try to prevent new stresses brought by urbanization. (See Appendix 5)

1. Weed Control

The presence of non-native plants in natural areas contribute greatly to habitat decline. Non-native, exotic, alien, noxious, introduced and non-indigenous are all synonyms for species that are intentionally or unintentionally introduced into an area outside of a species' native range. In general, non-native plants are known as weeds, which are defined as undesirable, unattractive, or troublesome plants, especially those growing where they are not wanted. Non-native plants have been introduced by a number of means, including contaminants with seed crops, livestock feed, ballast dump from Eurasian ships, horticultural materials, forage crops, and roadside vegetation.

Non-native plants in natural areas can be placed into two categories:

i) *naturalized* plants, which are species growing in natural areas in small groups that do not significantly displace or compete with the native flora, and

ii) i*nvasive* plants, or species which thrive in natural areas and subsequently displace the native flora and decrease diversity. This latter group is of great concern, as they can have devastating effects on habitat quality and wildlife as well as human use and enjoyment of infested areas.

Next to habitat destruction or conversion, non-native species are the most serious threat to natural areas and if not actively managed, natural areas can decrease in quality. Urban natural areas are highly susceptible to non-native species invasion, as they are fragmented and surrounded by degraded lands.

2. Controlling Non-native Plants

Management efforts need to be site-specific to ensure habitat quality is not compromised by weed control activities. For successful removal or control, disturbance factors that allowed for invasion must be removed and natural areas must be restored to their original condition.

Common management methods include herbicide, physical removal, biological control, prescribed burning, and integrated pest management.

Herbicides have been extensively used in natural area management but with mixed results. Although herbicides are effective at destroying live plants, non-native species produce a large number of seeds, which quickly re-colonize the area from the seedbank after disturbance. Variation in timing of application, concentration, and type of herbicide can have different effects on vegetation and target species characteristics need to be considered to select the most appropriate herbicide treatment. Alternative control methods are preferred to herbicide use due to concern over short and long term effects to target species and secondary effects to non-target species, including humans.

Prescribed burning is the most common form of prairie management. Widespread fire suppression has greatly contributed to the decline of prairie habitat. Burning prevents non-native and woody species invasion as well as suppression of existing populations. Prairies are typically burned in the spring and to a lesser extent in the fall, under low risk conditions. Timing of fire is extremely critical in order to control unwanted species and at the same time leave the desired native species unharmed. Plants are most susceptible to fire damage when they are actively growing, flowering, and producing seed. In general, spring burns promote the growth of dominant late flowering species and fall burns promote early flower species. Burning in other community types, such as forests and wetlands, is highly uncommon in urban areas because of the associated risk and long term regeneration. Where possible prescribed burning will be used for habitat management according to the Tall Grass Prairie Controlled Burn Policy

Hand Weeding Thistles Sturgeon Creek

Physical removal, such as mowing, hand weeding, and tillage are all methods that can be used for controlling non-native species. Mowing has similar effects on vegetation as natural disturbances such as burning and grazing. It is commonly used when burning is not possible and as with burning the timing of mowing is critical for non-native species control. Hand weeding has also been effective in small natural areas. Tillage is less commonly used in natural areas and more in habitat restoration.

Biological control involves the introduction of living organisms such as insect or disease into populations of invasive non-native plants in order to reduce vigour, reproductive capacity or density. Non-native plants are often introduced without natural control agents and when biological controls are absent these species have the potential to out compete and replace native species. Although success has been mixed, biological controls tend to reach an ecological balance with their host plant which reduces non-native plants to an acceptably low level. Currently biological control against plants in Winnipeg is used only by the Manitoba Purple Loosestrife Project.

Integrated pest management (IPM) is a relatively new method of controlling non-native plant species. It combines above control methods with preventative measures, increased knowledge of the target species biology and ecology, and restoration of the biotic and abiotic components of a habitat before or with the removal of the non-native species.

TABLE 3 – PLANT SPECIES OF MANAGEMENT CONCERN

Common Name	Scientific Name
Grasses	
Kentucky bluegrass	*Poa pratensis*
Quack grass	*Agropyron repens*
Reed canary grass	*Phalaris arundinacea*
Smooth brome	*Bromus inermus*
Wildflower or forbs	
Alfalfa	*Medicago sativa*
Burdock	*Arctium spp.*
Canada thistle	*Cirsium arvense*
Dandelion	*Taraxacum officinale*
Leafy spurge	*Euphorbia esula*
Purple loosestrife	*Lythrum salicaria*
Sow thistle	*Sonchus arvensis*
White sweet clover	*Melilotus alba*
Yellow sweet clover	*Melilotus officinalis*
Trees	
European buckthorn	*Rhamnus cathartica*

3. Maintaining Habitat Integrity

A dramatic or gradual change in the physical features of the site will have an effect on habitat. The draining of a wetland will cause the wetland species to be replaced by upland species, the flooding of an oak forest due to build up of the surrounding land and drainage blockages will cause the oak trees to die and will usually open the forest for weeds to take hold. A remnant prairie which is no longer experiencing wildfires will begin to change in plant composition tending towards more woody species such as shrubs and trees.

A well rounded approach should be taken to maintain habitat integrity. Prevention is the first and most effective method for maintaining habitat integrity. Prevention can include steps such as planning new developments so that drainage cannot back up and flood oak forest or so that wetlands are not dried through artificial drainage but are maintained as a component of the drainage plan for the area. In other cases artificial techniques such as controlled burns must be employed.

4. Prevention of Dumping and Removal of Trash

Dumping of trash including garden waste into a natural area is very detrimental to the area. While visually unappealing it also destroys the natural vegetation at the dumping site. The disturbance caused by dumping and the destruction of natural vegetation allows weeds to invade the natural area. Garden wastes also often contain large numbers of weed seeds which when dumped into a natural area can help destroy the integrity of the site. The anti-dumping by-law needs to be enforced for all ESNL and signage and public education should be used to help curb dumping into ESNL.

Removal of trash from dumping or other litter, which has accumulated in the ESNL must be included in the maintenance practices of the site. The City is responsible for maintenance of public lands and should include removal of trash from ESNL within maintenance costs. Public participation in cleaning of these areas should also be sought through partnerships with stewardship groups and community organizations.

5. Making the Site a better place to visit

Visitor traffic and appropriate or inappropriate uses of natural areas have an effect on site integrity. Several management techniques are used to guide visitor use into appropriate avenues. Trail development and interpretive signage help improve visitor experience as well as preventing soil disturbance, damage to vegetation and habitat fragmentation. Trails that are clearly delineated help guide visitors and contain site damage such as the introduction of exotic species, garbage and vandalism. In addition, trails can provide access that avoids sensitive areas, significant species and areas of wildlife use, discouraging uncontrolled access and habitat disturbance. When areas have been disturbed, restoration can be used to improve habitat quality.

Public awareness and support are vital in the protection and preservation of natural areas. Interpretive signage and educational information such as pamphlets, newsletters and guided tours can be used to identify the importance of natural areas or species. Increased understanding and appreciation of natural areas can help prevent future habitat destruction or degradation.

6. Trail Construction and Maintenance

Trails should be constructed in such a way that minimizes impact to natural features while providing an interesting and scenic route though the area. Construction practices should also avoid causing collateral damage to the ESNL. Trails should be built in such a way that they are accessible and usable for the majority of the year. Maintenance of trails should also be taken into account before building to ensure that the trail will be able to be properly maintained in the future. A lack of maintenance or useability of the trail will cause additional damage to the surrounding habitat as trail users seek to find ways around impasses or create their own routes through the natural area.

7. Signage, Promotional Materials

Promoting natural areas and education through interpretive signs is essential for building an understanding of the importance of ESNL and particular features. Funding for signage of all high use areas or areas with special concern should be allocated in part through budget and should be sought from partners and other sources. Promotional materials can also include support for stewardship group newsletters and inclusion of ESNL related information in press releases and media resources.

Photo: Naturalist Services

APPENDIX 5
Related Federal and Provincial Legislation

APPENDIX 5 - Provincial and Federal Legislation

1. Provincial Legislation

Water Protection Act

The provincial *Water Protection Act* was given royal assent and was proclaimed in 2005. 'The Act provides a new framework for better water management within the province and provides for the development of regulations for water quality standards, designation of water quality management zones, water conservation measures and invasive species. The Act also provides for development and implementation of comprehensive, integrated watershed plans.'

The Act will, through its regulations, likely increase support for preservation of any riparian ESNL or wetland which is connected to a watershed. As the regulations are still being written, a full analysis is not possible at this time.

2. Federal Legislation

Species at Risk Act

The federal *Species at Risk Act* directly pertains to the protection of federal listed plants, birds and various classes of animal species.

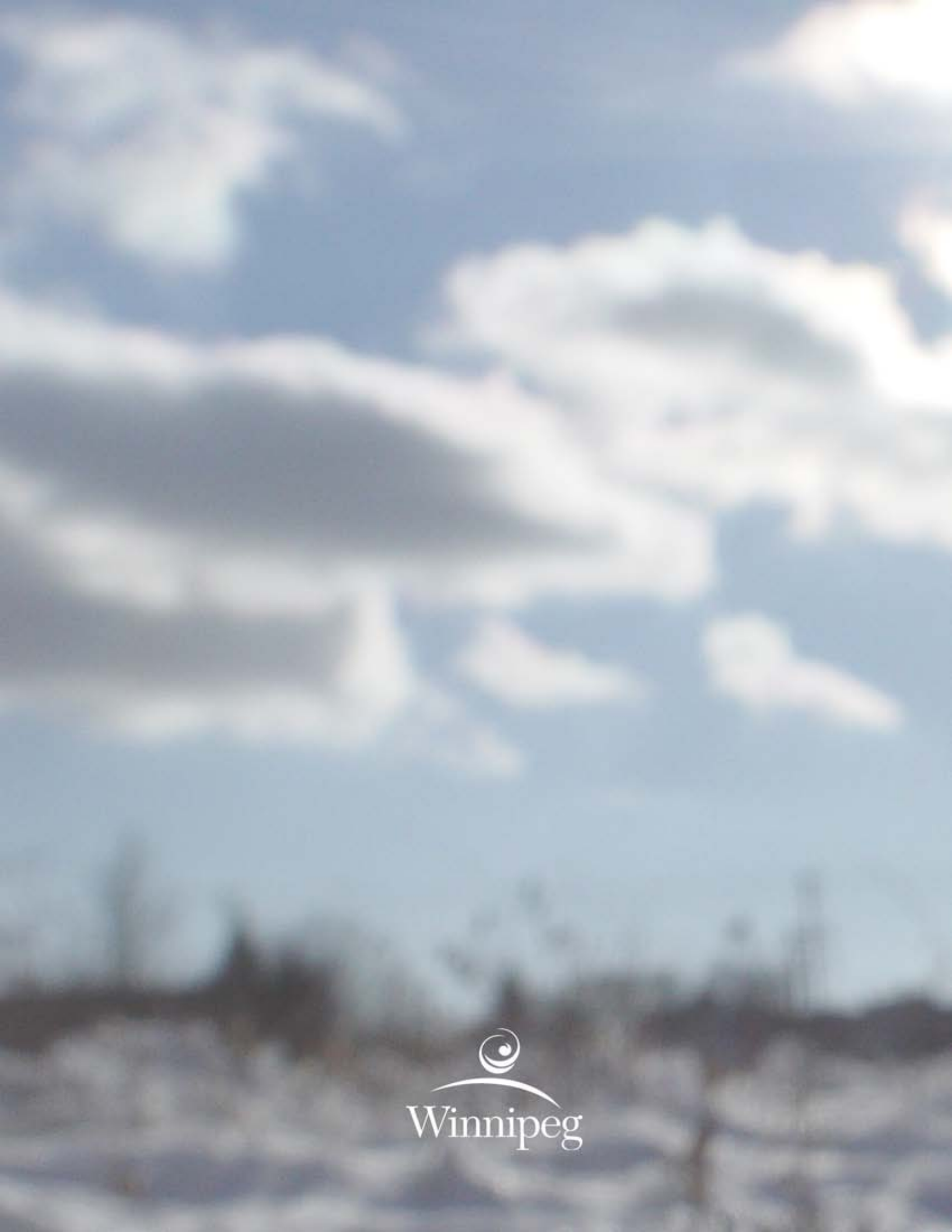
To date in the City of Winnipeg, there are few listed species found. The endangered Loggerhead Shrike is found in two locations. Several endangered fish species are believed to reside within the waterways and watercourses of Winnipeg, based on studies conducted in the late 1990's. The Naturalist Services Branch habitat assessment inventory has not listed any individual plant species at risk to date.

Eastern Loggerhead Shrike

Fisheries Act

The federal *Fisheries Act* prohibits anyone from carrying on any type of work project that causes the harmful alteration, disruption or destruction of fish habitat without statutory authorization. The Act also prohibits the deposit of deleterious substances into water frequented by fish.

This act tends to support protection of any ESNL that is adjacent to or contains fish habitat. In some cases, this act protects areas that are direct fish habitat better than Plan Winnipeg directives.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