

# Naturalization Guidelines

a guide to retrofitting existing park spaces





# Contents

**1 Introduction**

**3 About This Guide**

**5 Defining Naturalization**

6 *Managed Parks and Open Spaces*

7 *Benefits of Naturalization*

8 *Guiding Principles*

**13 Regional Initiatives**

14 *The City of Edmonton*

16 *The City of Saskatoon*

18 *The City of Winnipeg*

**21 Steps to Naturalization**

22 *Site Analysis*

25 *Initial Discussions*

26 *Concept Planning*

33 *Detailed Discussions and Final Planning*

34 *Implementation and Construction*

**37 Naturalization Techniques**

38 *Part One: Establishment Techniques*

42 *Part Two: Management Techniques*

**45 Local Initiatives**

46 *Naturalizing Memorial Drive*

**59 Conclusion**

**61 Acknowledgments**

**Appendices**

*Supporting Documents*

*Plant Material Resources*

*Image Sources*





# Introduction

*As Calgary grows, The City has introduced a naturalization initiative to bring ecological and aesthetic diversity of landscapes into public spaces. This document will explore the basics of the process of site naturalization.*

## **Vision**

Calgary currently contains over 8000 hectares of open space areas, or ‘parklands and natural areas’ as described by The City of Calgary Parks. As Calgary grows, significant resources such as materials, time, and capital must be planned and deployed throughout the city to maintain our vibrant park spaces.

The City of Calgary Parks has introduced a naturalization initiative to bring ecological and aesthetic diversity of landscapes into public green spaces. This initiative is intended to “create new landscapes and designs within our open spaces; to help control weeds, pests, and diseases; to create sustainable landscapes that help support plant, animal and insect life (biodiversity) well suited to Calgary’s climate. Naturalized areas in Calgary will encourage more beneficial and livable parks, with reduced traditional landscaping and long term maintenance costs such as fertilizer, pesticides and irrigation” (The City of Calgary, 2015).

## **Design Process**

A key component of this process is design—crafting the landscape in a manner that illustrates intent and purpose. This document will explore the basics of the naturalization process and will touch on how analysis, community engagement, and concept planning integrate into the process. Although these steps have been laid out to provide basic

knowledge. The planning and implementation of naturalization projects take time. Challenges can include a lack of funding, community resistance, invasive species, erosion, and extreme weather patterns. As the years unfold, naturalization projects take careful planning, persistence, and patience.

It is important to note that any naturalization project will need to be discussed thoroughly with The City of Calgary in order for it to move forward in a meaningful way. They will guide site eligibility, priority within the open space areas, and will ultimately assume responsibility for any project brought forward.

## **Policy Context**

This document is published into a pre-existing realm of background materials within The City of Calgary Parks and others that are publicly available. These guidelines have a significant relation to work done in two previous documents: the Habitat Restoration Project Framework, 2014 (HRPF) and Our BiodiverCity, The City’s 10-year biodiversity strategic plan. This document primarily applies to retrofitting existing open space areas, whereas the HRPF outlines processes for establishing naturalized areas within new park developments. For more information, refer to the **Supporting Documents Appendix**.



# About This Guide

*This document is intended as a user-friendly tool and a “field handbook”. It is for communities who are interested in working with The City of Calgary in creating a healthy, ecologically diverse, and low-maintenance park or open space.*

## **Key Audience**

This document is for anyone in Calgary who may have identified a public space or park that is in need of renovation. It is for communities in Calgary who are interested in working with The City to create a healthy, ecologically diverse, and low-maintenance park or open space within a community. It is also for those who want to learn more about current City initiatives.


These documents are not intended to address ecological restoration, nor are they a design shortcut or an exhaustive resource on the topic on naturalization. Overall, this document is intended to be an illustrated outline of the process of how a naturalization project might be accomplished within an existing community.

## **Objectives**

This guide will help you:

- Identify ways to be involved in a naturalization project in your community
- Understand the benefits of naturalization
- Know what questions to ask The City of Calgary Parks, a designer or a landscape architect during the naturalization design process
- Learn about and be able to access more resources about naturalization
- Determine key checkpoints in the process

## **Checkpoints**

Throughout this document, checkpoints  are used to identify when The City of Calgary Parks must be involved. They will determine at various stages if a project is eligible for implementation, and can identify if professional assistance is needed to help facilitate the process.

For more information, please visit [www.calgary.ca/parks](http://www.calgary.ca/parks) or call +311 within the Calgary city limits.

## **Using the Guide in Practice**

You can use this guide to:

- Inform the decision-making process
- Be a point of departure for naturalization projects
- Increase communication between The City and community organizations
- Facilitate a team approach to design



# Defining Naturalization

*This section provides a definition of naturalization based on the Habitat Restoration Project Framework.*

In broad terms, naturalization is a process for transforming a cultivated landscape, such as a lawn for instance, into a landscape more indicative of the naturally occurring landscape of the region. Naturalization also includes deliberately reintroducing native species to a site in order to improve the natural environment. It has significant social, environmental, and economic benefits for Calgary.

The Habitat Restoration Project Framework (HRPF, refer to **Supporting Documents Appendix**) outlines a range of habitat restoration types, which include: reclamation, naturalization, rehabilitation and restoration. Each type of habitat restoration involves different levels of resources or inputs to achieve the desired end goal.

Although not within the scope of these guidelines, the other types of habitat restoration are important activities currently being employed by The City at suitable

locations. These activities are consistent with implementation of Our BiodiverCity: Calgary's 10-year Biodiversity Strategic Plan (refer to **Supporting Documents Appendix**) and the HRPF.

The HRPF defines naturalization as:

*a set of activities intended to improve and enhance the natural environment through the deliberate reintroduction of species native to a given area or that are well adapted to the climate circumstance. A naturalized site is characterized by higher levels of ecosystem function and biodiversity compared to a reclaimed site, but has lower levels of ecosystem function compared to rehabilitated or restored sites in a similar ecosystem.*



# Managed Parks and Open Spaces

*This conceptual diagram illustrates how resource inputs generally change over time for parks and open spaces that are manicured versus naturalized.*

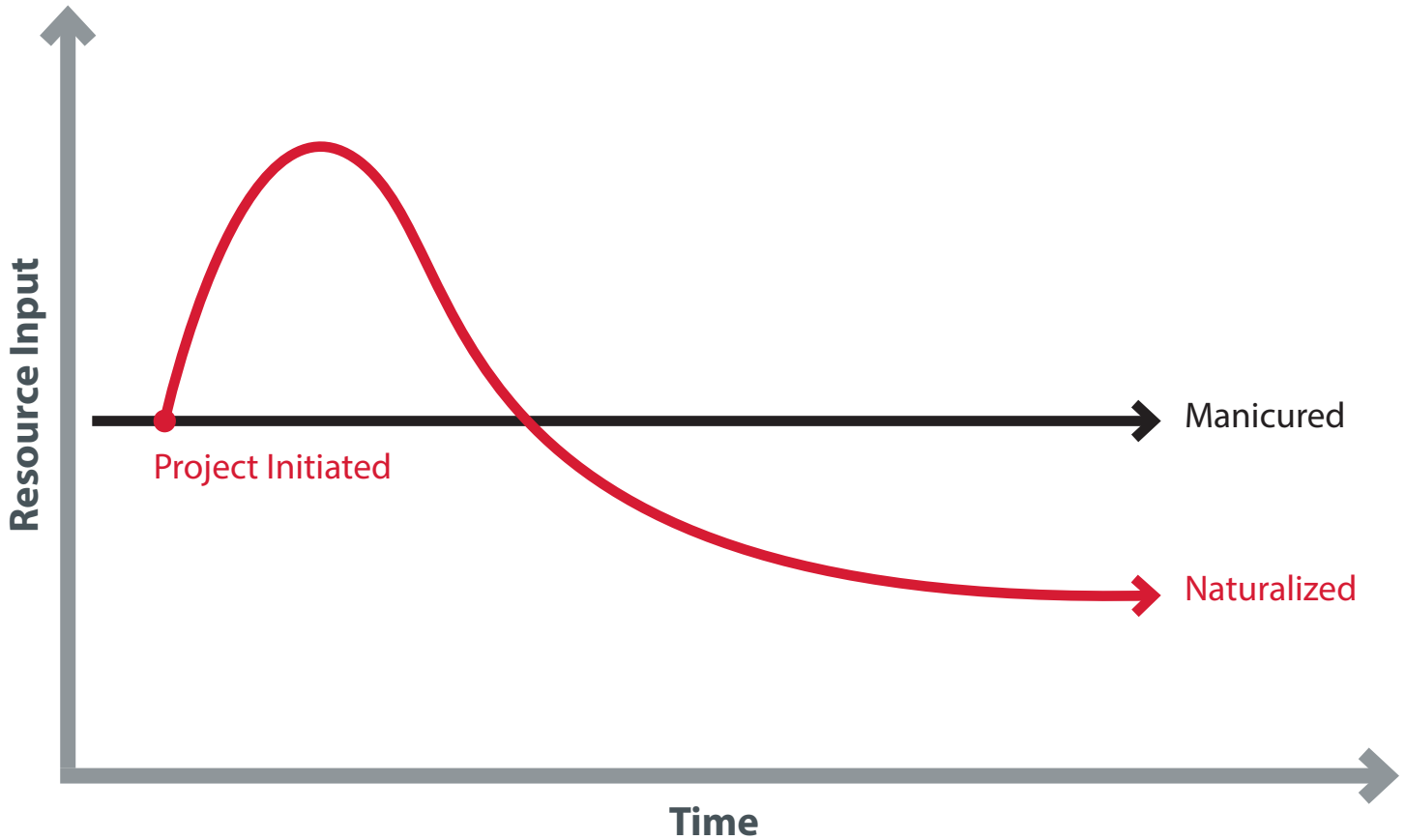


Diagram provided for general illustrative purposes only; actual changes in resource input over time will vary depending on site conditions and details of the specific project.

Although a large initial resource input may be required to create a naturalized space, the resource inputs are generally reduced over time as the landscape becomes more established. The initial resource input typically occurs in the first two years (refer to **Management Techniques** on page 42). Resource inputs include the financial cost and energy necessary to facilitate actions like reseeding, planting, weed control, site maintenance, and monitoring.

# Benefits of Naturalization

*This section outlines why naturalization is important. It explains the significant environmental, social, and economic benefits that naturalization has for Calgary.*

Although promoting naturalization on the merits of its reduced maintenance costs is common, the environmental and social goals are equally important. Naturalized areas have a number of significant benefits in the urban context:



## Environmental

- Greater biodiversity
- Protects natural heritage
- Improves stream health and riverbank stability
- Creates habitat
- Reduces or eliminates need for pesticides
- Greater ecological benefits to local wildlife species (native birds, bees, insects and mammals)
- Can form connections with surrounding ecosystems to help restore landscape functions
- Improves air and water quality
- Moderates temperature
- Improves soil physical properties, thereby enhancing conditions for tree and shrub growth



## Social

- Naturalized areas have a greater density and can provide a noise buffer or screen for developed areas
- Fosters a new relationship of urban environmental stewardship and can increase awareness of Calgary's natural systems and processes
- Educational and experiential benefit of observing naturalized landscapes change throughout the seasons and over longer periods of time
- Spending time in naturalized areas promotes mental health and relaxation



## Economic

- Reduced energy consumption and energy costs associated with equipment and labour
- Trees, shrubs and herbaceous plants capture rainwater which takes pressure off urban drainage systems and may help reduce flood impacts
- Reduced maintenance costs—both time and material inputs

# Guiding Principles

*This section outlines the basic guiding principles that should be in the forefront of any naturalization project.*

## The Importance of Guiding Principles

The guiding principles provide a framework to guide and organize the process. Refer to them regularly throughout the process to ensure the project remains on track. Through the naturalization process, we can increase the biodiversity of Calgary's open space areas and work to create a more functional,

robust, and visually striking landscape reflective of the character of the region. The aim is to increase the health of our parks and reduce long-term energy inputs (time, resources, fertilizer, pesticides and irrigation).

## Connectivity



One of the commitments of The City's 10-year biodiversity strategy (refer to Our BiodiverCity in the **Supporting Documents Appendix**) is to plan and manage Calgary's parks and open spaces as a connected network of habitats. Strengthening connections between existing natural areas and parks is an inherent benefit of naturalization that will help provide corridors for wildlife movement and facilitate native plant propagation throughout neighbourhoods.

## Biodiversity

Biodiversity is the variety of life in an ecosystem. It is a key benefit of a naturalization project. While the goal of a naturalization project isn't explicitly to complete habitat restoration, increased biodiversity within a site will occur as a consequence.

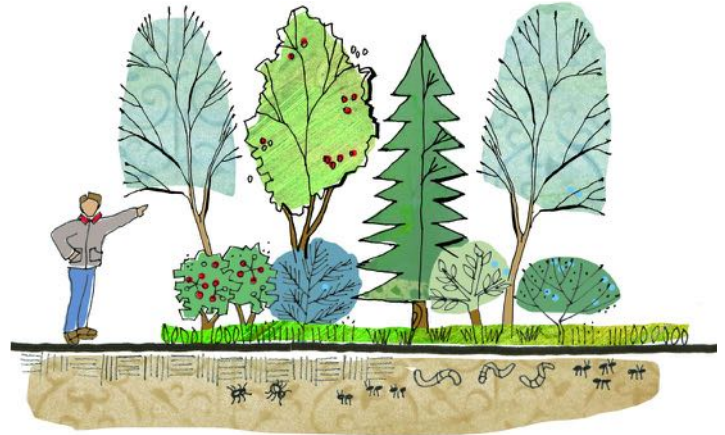
Biodiversity is inherent in naturalized areas, and through the introduction of naturalized spaces into existing parks, the overall biodiversity of the park will increase. With many naturalized areas in place, it is possible to reconnect landscapes and ultimately restore the important functions and biodiversity of Calgary's natural ecosystems.



# Guiding Principles

## Structure

Natural landscapes have a clear vegetation structure to them. Some contain: an upper storey, typically taller trees; an understorey, typically smaller trees and shrubs; and groundcovers like perennials and herbaceous plants. Layered structures can also be found in non-forested and grassland ecosystems that contain tall grasses, short grasses and shrubs, herbaceous plants and non-vasculars. Each level of the landscape structure is adapted to take advantage of the micro-climatic conditions of each storey. In addition to the utilization of native plant materials, replicating this structural layering is key to establishing a vigorous, self-sustaining natural landscape area.



Soil structure is a primary building block of a successful naturalized landscape. Just like building a house, a landscape needs a good foundation. Soil contains fungus, insects, nutrients, burrowing mammals. It acts as a sponge to absorb water. Without a good soil base, it can take significantly more time and effort to establish a naturalized area. If the soil base is good, a naturalization approach could be as simple as adding some topsoil and reseeded with a custom seed mix.

## Management and Monitoring



Once established, naturalized landscapes are generally less maintenance than manicured landscapes. During their formative years, while the plant material establishes, weeds will need to be removed, plant material may need to be replaced, and the soil base may need to be topped up. All of these maintenance requirements will be the result of careful monitoring. Management and maintenance are a component of stewardship, which is an important aspect on the success of a naturalization.



# Guiding Principles

## Community-Led Engagement



A critical part of the naturalization process will include talking with the community about the naturalization idea. Gathering insights about the proposed location, history of the area, and getting an understanding about how the residents might view such a project are all important discussion items.

Additionally, keeping everyone informed on the project and the intentions will help to build community support, contributing to the success of the project. Discussions with the community cannot be understated; they are a vital part of the naturalization process. Attending a community meeting is an excellent way to begin the discussions with residents.

## City-Led Engagement

The City of Calgary defines engagement as “purposeful dialogue between The City and citizens and stakeholders to gather information to influence decision making.” City-led engagement provides a platform to collect feedback on a project that can be used to help shape the outcome. Citizen and stakeholder input helps City leaders and decision-makers to better understand the perspectives, opinions, and concerns of people potentially impacted by City decisions. City staff are directed to develop and adhere to the Engage Administration Framework ([refer to Supporting Documents Appendix](#)).

City-led engagement will require the project to be at a point where a design illustration or graphic is advanced enough to allow citizens to view, understand, and comment on the final outcome of the project.



Talk to The City about when a formal engagement should occur.



# Guiding Principles

## Education



The naturalization process for a landscape involves working with nature in an intimate fashion. This includes both people and communities. Naturalized landscapes are becoming more common, as evidenced in the examples from other communities across western Canada (refer to the **Regional Initiatives** section on page 13). Despite increasing examples, there is often a lack of basic information and understanding on the part of the general public. As part of any naturalization project, sharing information with and guiding the public will be key factors in conjunction with the engagement initiatives. Informed and knowledgeable residents will result in more in depth discussions and stronger community support.

Education opportunities such as public information sessions, on-site project signage, and announcements in local community newsletters should be explored.



# Regional Initiatives

*This section provides examples of three other communities in western Canada with successful naturalization initiatives.*

The spectrum of innovative initiatives and naturalization success stories in public spaces across western Canada is remarkable. Cities and towns across the prairie provinces are engaged in naturalization. The following three examples illustrate successful municipal naturalization projects from Edmonton, Saskatoon, and Winnipeg. Naturalization initiatives are no longer only found in leftover spaces or residential gardens, but are becoming part of an important transformation for municipalities as a whole. Naturalization is not a new or trendy landscaping practice—and it has a

crucial role in the future of Calgary. As a growing number of communities, organizations, and individuals are discovering the benefits of naturalization, many are realizing that naturalization can also be a complex and challenging process. Environmental challenges can include weed problems, low plant survival rates, unpredictable weather patterns, and unavailability of appropriate native plants. The following examples are presented to illustrate that naturalization initiatives can achieve success in climates similar to Calgary.

# The City of Edmonton

## Summary

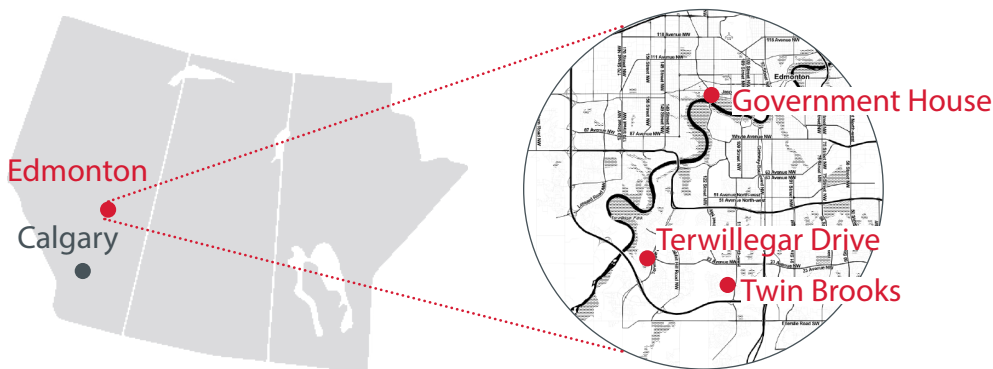
Beginning in spring 2014, The City of Edmonton identified a number of areas throughout the city to be naturalized, the majority being along arterial and collector roadways. In 2014 and 2015, 70 hectares of mowed turf in Edmonton was transitioned into naturalized spaces.

Partnering with the University of Alberta, The City of Edmonton initiated a joint research project on the benefits of naturalized areas in urban areas. The focus of research was to determine how to reintegrate native ecological components into green spaces of urban centers. The study lists a number of benefits for naturalization: reducing maintenance costs, promoting preservation and conservation,

and restoring environmental systems. For more information, refer to the [Supporting Documents Appendix](#).

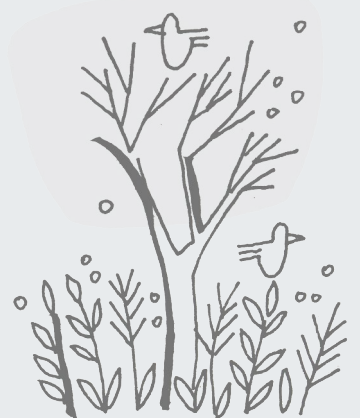
A tree planting initiative called Roots for Trees was developed in a similar time frame to the naturalization initiative. The goal is to create a sustainable and diverse urban forest through engagement and public education opportunities in Edmonton. It achieves this through partnering with corporations, individual residents, and community groups for events and programs. In addition, The City of Edmonton plans to develop a Master Naturalization Program over the next 2-3 years.

## Proximity to Calgary



## The City of Edmonton's naturalization process

1. Stop regular mowing (turf maintenance) to allow grass to grow naturally.
2. Plant native trees and shrubs to establish an ecosystem.
3. Plant understorey (small trees, shrubs and flowers) to enhance habitat.





## Naturalized areas in Edmonton



Terwillegar Drive



Twin Brooks



Government House Park



Government House Park

### What about weeds?

The City of Edmonton has stated they will monitor naturalization sites for weeds and apply weed control where necessary under their Integrated Pest Management Plan, which minimizes the use of chemical herbicides. As naturalized sites mature, the healthier ecosystem is much more resistant to invasion by weeds.



Dandelion, a common weed in Edmonton and Calgary



# The City of Saskatoon

## Summary

The City of Saskatoon began exploring alternative landscape management strategies in the 1990s. Typically, Saskatoon had maintained their parks in a very manicured and traditional fashion, with plantings, lawns, and sports fields. In an effort to provide residents with a visually appealing landscape and reduce landscape maintenance costs, the City explored naturalization of their park spaces as a viable alternative.

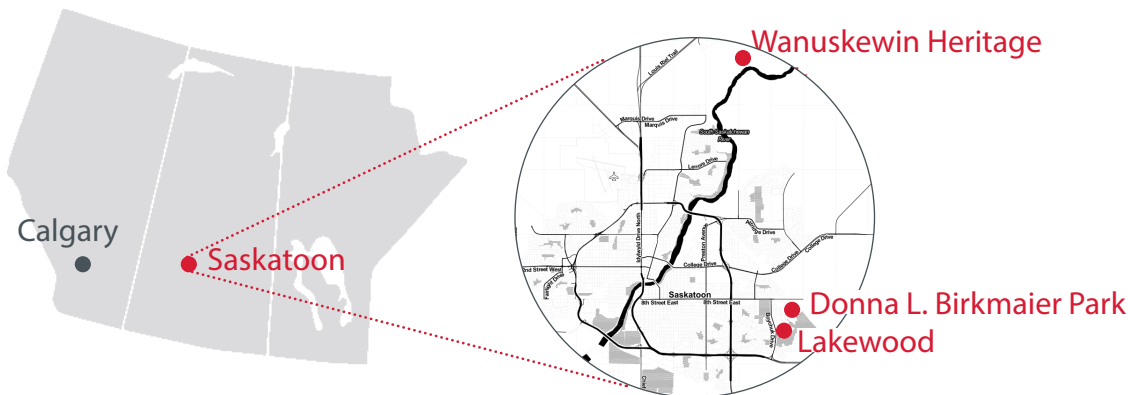
One of their key challenges was landscape maintenance. Compared to traditionally maintained parks, naturalized areas required City park technicians to have different skill sets. Generally, the City staff needed to have a comprehensive

understanding of ecology—they have to know how to manage the land, as opposed to simply cutting grass and pruning plants.

Saskatoon currently has a number of naturalized areas (and remnants of native prairie), including the Lakewood Wetland, Gabriel Dumont Park with large areas of unmowed grass, and small, biodiverse islands of park or open space throughout the City.

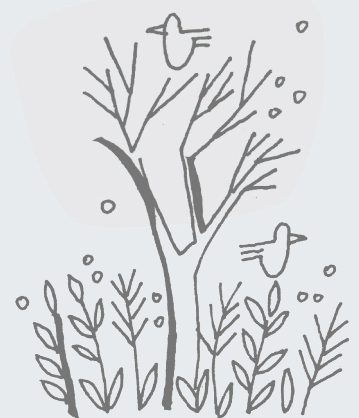
Most importantly, the City of Saskatoon noted that public education is an important part of establishing naturalized parks, ensuring that residents understand the intent behind the process.

## Proximity to Calgary



## The City of Saskatoon’s naturalization process:

1. Establish an area of native grasses or wildflowers.
2. Plant native trees, shrubs, and wildflowers to increase natural seed dispersal and introduce structure into the landscape.
3. Increase staff knowledge and skill sets, and adapt horticultural maintenance to ecological maintenance.



## Naturalized areas in Saskatoon



Donna L. Birkmaier Park



Wanuskewin Heritage Park



Lakewood Stormwater wetland



Wanuskewin Heritage Park

## What about weeds?

The City of Saskatoon acknowledges that native plants can take longer to establish, allowing invasive weeds to colonize an area if not appropriately maintained. Land management means site-specific monitoring, evaluation, and decision-making based on plant ecology, rather than traditional maintenance approaches about manicured landscapes. Public education and appropriate maintenance in early years have helped garner public acceptance.

**Naturalization Guidelines** | The City of Calgary | 2017



Canada thistle, a common invasive species



# The City of Winnipeg

## Summary

Beginning in the early 2000s, the City of Winnipeg has been taking a naturalized approach to the maintenance of select parks and open spaces. The Naturalist Services branch of the Parks and Open Space division has identified three areas designated as “no-mow” or reduced mowing:

1. **Along waterways:** to improve water quality and prevent erosion
2. **Under oak trees:** to aerate soil and preserve the native oak forest
3. **Along existing natural areas:** to create a buffer zone that encourages native species to colonize

Tree planting and wetland restoration is also being

implemented in select areas. Engineered stormwater control features like stormwater ponds are being designed to simulate natural processes and planted with native wetland species.

Winnipeg’s Naturalist Services works alongside and assists many stewardship groups throughout the city. These groups are typically volunteer-based and are involved in planting trees and other native plant species, removing weeds and trash, building trails, and installing information signs.

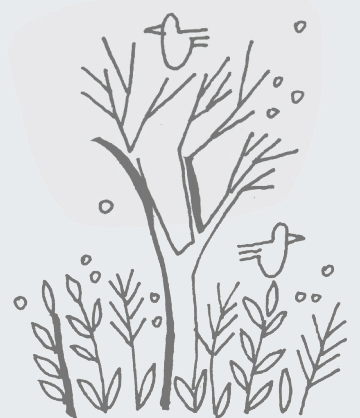
Naturalist Services also conducts habitat assessments to determine quality and specific habitats of green spaces and compile an inventory of the different habitat types throughout the city.

## Proximity to Calgary



## The City of Winnipeg’s naturalization process:

1. Stop mowing along waterways, under oak trees, and along existing natural areas.
2. Plant native trees and shrubs, and restore wetlands.
3. Conduct habitat assessments and steward the land.





## Naturalized areas in Winnipeg



Royalwood naturalized stormwater pond



Sage Creek: new development with naturalized plantings and wetlands



Seine River naturalization and restoration



Seine River naturalization and restoration

## What about weeds?

Originally a low quality forest disturbed by development and erosion, the river bottom forest in Crescent Drive Park became a “no-mow” zone. Initially the forest was dominated by non-native species. Through weed management, such as hand pulling or cutting, the City of Winnipeg controlled invasive plants. Native species gained a foothold and the forest is now a diverse vegetation community and wildlife habitat.



Crescent Drive Park has a no-mow zone beneath many trees







# Steps to Naturalization

*This section outlines how to get a naturalization project off the ground and moving: site analysis, initial discussions, concept planning, detailed discussions and final planning, and implementation and construction.*

The following initial steps will provide a basic understanding and guide for the naturalization process. It is important to note that this section is a cursory overview of potential design techniques. The steps are not a design shortcut, nor an exhaustive resource. They are intended to be a point of departure on how a naturalization project might be accomplished within an existing community. This section should help community members and leaders to ask informed questions during the design process and when engaging with The City. Each project will require a thorough investigation unique to the challenges, risks, and opportunities of the site.

When reviewing an area for naturalization opportunities, the intent should not be to redesign the space, but to introduce a series of naturalization approaches that will capitalize on under-utilized spaces and will help the space function better for the community.



Speak with The City of Calgary to determine the amount of municipal or professional assistance required for each specific project.

# Site Analysis

## Introduction

The first and most important step in the naturalization process is an analysis of the site. It's the site that drives the design. A thorough review of the existing conditions on the site prior to engaging in the planning and design will be invaluable in creating an effective naturalization project. A key aspect of site analysis is that it will help determine the eligibility of the proposed site for The City of Calgary.

This site analysis will also reveal the areas that could be considered for a naturalization retrofit. In most cases, a cursory review of the site will reveal the most effective areas where naturalization can be introduced. These areas may be obvious such as sloped areas or irregularly configured 'leftover' spaces around the perimeter of the site. Ideally, the area for naturalization should be as large as possible, without compromising the existing use and function of the park.

It is important to consider the current use of the park and note the activity types present. A park with substantial active use may only accommodate a small naturalization project, perhaps split into

small areas throughout the park. In comparison, a park with a low active use could reasonably accommodate a larger project. Observation of the park over a period of time and at different points during the day will reveal these use patterns and help to provide more insight on the extent of the naturalization project.

Important questions when initiating the naturalization process in a park space include:

- What makes this park successful right now?
- How is the park currently being used and what are the activity types?
- What are the elements that park users appreciate?
- Are there areas within the park that are not designated for active recreation?
- Would this area be suitable for applying alternate landscaping techniques?

The answers to those questions will form the structure of the naturalization design project. They will become the constant objects (or constraints) and will be important considerations in the engagement process. These elements will have been revealed during the community engagement process.





### **Site History**

It is anticipated that the selected site will be park space on City property. In some cases, especially with inner-city greenspaces, the site may have a history which could impact any proposed redevelopment plans. It's important to investigate any prior uses that could prohibit the establishment of native plants. Conversely, the site may have a rich history that can be used as a design theme or as a promotion for the project.

Reviewing the site history may help determine which plant communities existed on the site before disturbance. Historical plant material could be used as a design model for the new naturalization project. Determining the selection of native plants is easiest on a site that still contains remnants of original and naturally-occurring growth. It is sometimes possible to obtain information on the local plants by observing nearby natural areas with similar ecological conditions.

### **Site Context**

The design will be influenced by the character of the surrounding neighbourhood or landscape, site characteristics, and the size of the site. A large site may allow more opportunities using strictly native plant species, whereas a smaller site may only permit a limited naturalization project. A review of the adjacent landscape and vegetation is important to ensure that there won't be an ongoing source of weed invasion from blown seeds.

Naturalization of a site should be balanced with safety considerations as well. Finding a balance between utility infrastructure setbacks and naturalization is a challenge that has to be reviewed when approaching a site analysis.

✔ Consider The City of Calgary's required utility setbacks. Based on the Land Use Bylaw (refer to **Supporting Documents Appendix**), The City requires specific setbacks from certain City infrastructure. This is especially true in areas adjacent to roadways.



# Site Analysis

## Soil Analysis

Site analysis should also have a simple review of the soil base. How deep is it? How does it feel (should feel moist and spongy, like a good sponge cake)? What is the colour (it should be a nice dark brown, like cocoa)? Are there bugs present (a shovel test will reveal these)?



If a soil test is required, speak with The City of Calgary. They can organize digging for a sample and submitting a sample to to a soil testing laboratory.

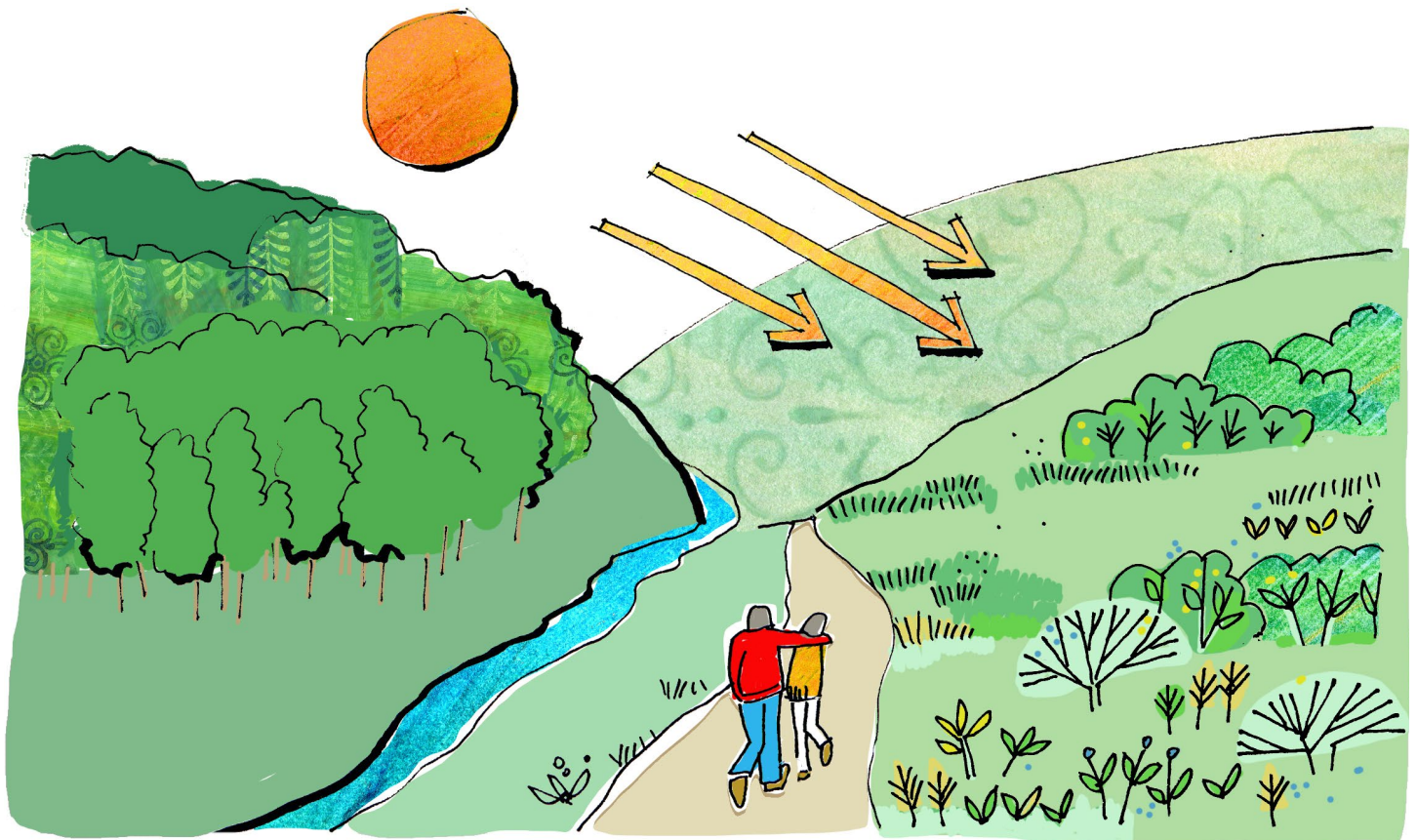
## Microclimate / Exposure

Microclimate is the specific thermal and atmospheric conditions of a small area. Observing the site over different times of day and during different times of the year will help determine how best to shape the design. Does the area get plenty of sun? Is it shady? Is the site exposed to wind? Each of these factors will affect the comfort, health, and well-being of people, plants, and animals. They are important consideration that will influence the design.

## Topography

The slope of the site is also an important consideration. A north facing slope, for example, will typically be cooler and wetter than a south facing slope. Plant materials should be selected on the basis of which will do best under the existing conditions of the site.

The topography of the site will also impact drainage. If the slopes are generally steep, water will run off quickly and not be retained for the plant materials. Conversely, if the site is relatively flat, water won't drain effectively and could end up drowning the plant materials.





## A Note on Riparian Areas

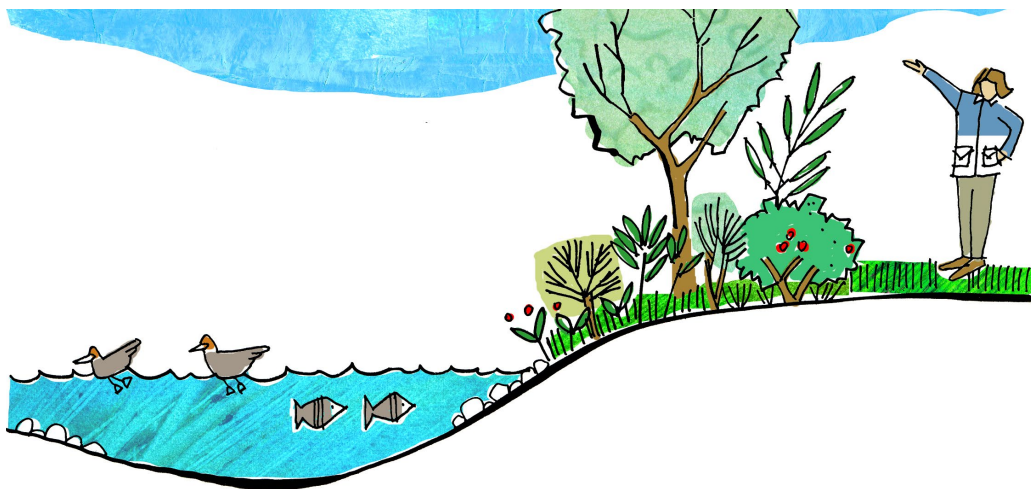
The province of Alberta identifies riparian areas as 'strips of green vegetation influenced by water and found around creeks, sloughs, rivers and lakes'. Generally, they are the landscape transition areas between water and land.

There are a number of Federal and Provincial Acts that have to be taken into account when considering naturalization of a riparian area. Federally, the Navigable Protection Act which regulates any construction in any navigable body of water, such as the Bow River, requires approvals from Transport Canada. The Fisheries Act deals with the protection of fish habitats within bodies of water, and approvals

must be granted from the Department of Fisheries and Oceans Canada (DFO).

While naturalization of riparian areas is a part of the City's goals, the sensitive nature of these areas and the involvement of the various levels of governments require that these areas be dealt with at a municipal rather than a community level.

Further reading and associated reference materials have been listed in the **Supporting Documents Appendix**.



## Initial Discussions

One of the key principles mentioned earlier was engagement. Engagement of community members, City administration, and related professionals is a critical component in the success of the design.

At this point, contact The City to inform them of the project and to have high-level discussions about goals and feasibility. Ask for a single City employee to act as the main point of contact.

As mentioned earlier, a prudent step is engaging local residents as early and as often as possible. Neighbourhood community groups are an excellent source of knowledge on the local greenspaces and

can be quite passionate about them. Residents can give confirmation for observations made on the site and can provide informed programming suggestions. Engaging with the community fosters stewardship for the naturalization project. Be prepared, however, for some intense discussions around changes to any greenspace. People can be quite invested in their community parks and most likely will require a fair amount of detail regarding any proposed changes.

When engaging in discussions with City staff, it often helps to note that preliminary discussions have been conducted with community.

# Concept Planning

## Introduction

Concept planning is the stage of creating a general plan that illustrates the site layout, proposed naturalization area, and any other features being proposed for the space (eg. pathways, benches, playgrounds, etc.).



Creating a concept plan can be a complex and technical process. Ask The City to advise if professional assistance is needed.

A successful naturalization project will show design intent in the concept planning. Establishing a naturalized area without any clear visual indicators that can be identified by the public will often result in complaints that the park is not being effectively maintained. Essentially, visitors will think that no one is cutting the grass.

## Important Requirements

The City outlines the requirements for concept plan development for open spaces within the city.

1) Locate and identify the major functions/spaces/constructed features with respect to the site (The site analysis from the previous step will be valuable

in establishing the locations and shapes of the elements).

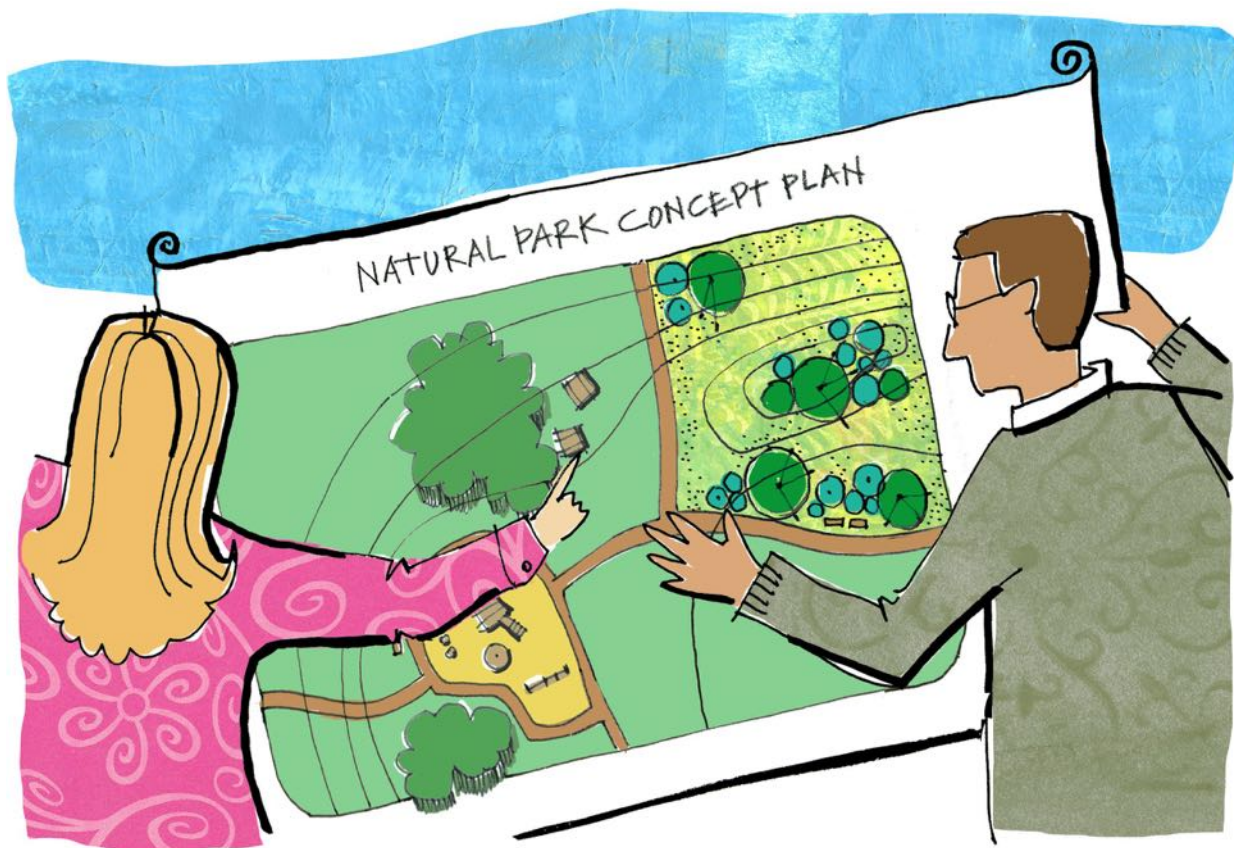
2) Show the relationship of the functions/spaces/constructed features with respect to each other.

- Show the relationship of the site to its surrounding land uses.
- Determine a preliminary resolution of technical requirements.
- Indicate the location of the utility rights-of-way within the Parks and Open Space areas.
- Indicate existing grades, proposed direction of drainage, slope percentage and adjacent land use information if the data is available.

For more information on these requirements, consult The City of Calgary's Development Guidelines and Standard Specifications: Landscape Construction (refer to **Supporting Documents Appendix**).

The above requirements are typically oriented toward the design of new park spaces. Retrofitting an existing park involves additional considerations. Following are some elements which should be taken into account when introducing a new design project into an existing park.





### **Seating**

In addition to regular site furnishings like benches and picnic tables, all parks have alternate forms of seating like walls, steps, and natural features like boulders. Considerations should be given to utilizing alternate seating opportunities to not only define the naturalized areas within the site but also to attract users to the naturalized areas.

### **Existing Trees**

A site may have groupings of, or individual, existing trees within it, which is a great thing. Trees, as a distinct vertical element, are an excellent design element with many benefits, including aesthetics, shade, safety, and habitat creation.

### **Built Elements**

Fences, retaining walls, and pathways can be used to define the extents of the naturalized areas within the site. Strong vertical elements are necessary to visually indicate the deliberate intent behind the naturalization project, especially when the plants are covered in snow or have lost their leaves.

### **Topography**

Sloped areas present good opportunities for naturalization. Naturalized sloped areas on a site can become the key element of a naturalization project within a park due to their high visibility.

Plant materials should be reviewed and located in appropriate areas on the site where they are best adapted to the topographic conditions. Drought tolerant materials would do better higher up the slope. Plants with higher water demands would do better at the base of the slope where water collects, for example.

### **Pathways**

Most parks will have desire lines (informal pathways worn down by foot traffic). They are typically the shortest route through the park and are usually created by users who are using the site to get from one destination to another. They are an expression of the adage "the shortest distance between two points." These desire lines make great design tools



# Concept Planning

because they can separate the distinction between a naturalized and manicured area within a large site.

## ***Distinct Edges***

To convey the notion of a guiding hand behind the naturalization effort, create distinct borders or edges in a design. Ensure viewers can tell the difference between the manicured and naturalized areas within the park. These distinctions convey to viewers that a design intent is present and that the naturalized area isn't just haphazard. Borders or leftover edges can consist of pathways, lanes, fences, or even boulders. Some of the existing elements, like a pathway, should be used to define the extent of the natural area. Other elements, like a post and cable fence, may need to be inserted into the site as part of the design to help clarify the distinction.

## ***Water***

Traditional site engineering practice considers surface or rain water as something to be eliminated from the site and directed into the storm sewers. In

contrast, however, water shortages are becoming an issue within Calgary and the surrounding area, making water a resource to be captured and reused.

Water is a key element in the establishment of any successful landscape. Generally, the naturalized areas may not have readily available access to water and the sites will most likely not be irrigated. If the park is older, the irrigation system may be abandoned or not functional. There are numerous ways to capitalize on scarce water resources. Incorporate passive stormwater collection or low-impact development initiatives. Slope the land to direct the water to a low area (passive stormwater collection). Allow for extra depth of topsoil (absorbent landscaping). Fill underground trenches with rock to allow for water storage below the surface. On sloped sites, building a small series of terraces will help to slow the flow of water, allowing water to be captured and re-used in the naturalized area. These terraced areas can also be used for planting since they will be relatively flat.





# Concept Planning



## **Exposure and Views**

Consider the views both into the site and from the site. There may be key views into the site that will highlight the landscape and add some profile to the project.

## **Signage**

A key element of a naturalization project is public perception. Descriptive signage on the site and community engagement will help to convey the message that the naturalization project has intent and purpose behind it. The signage can help the public understand that the site just hasn't been neglected or is unmaintained. With the perception that maintenance is not being done, phone calls and complaints to the Parks department may negatively affect the project.

## **Plant Material**

The original and naturally-occurring landscape of the region is a constantly changing system composed of plants, animals, insects, microorganisms and soils. The primary visible element, vegetation, is one of the main participants in this ever-evolving system. In addition to determining types of vegetation which previously existed on the site, there are design elements that must be accounted for in order to achieve a naturalized landscape.

A naturalized landscape will contain a certain amount of transitional spaces between vegetation communities. Typically, the grasslands will transition to an edge area (composed of shrubs), then into a forest or woodland condition (composed of trees). These types of transitions are not size-dependent and don't necessarily need to be present within a naturalization design. The design could

# Concept Planning



be comprised of a single grassland ecosystem, for example. However, to better implement a naturalized landscape function, and subsequently provide a more accurate design, these transitional areas should be considered in the design. A woodland area is composed of a multi-layered canopy of taller trees and below that, understory trees with a ground layer of shrubs and herbaceous, or non woody, plants. This forms the landscape structure (refer to the Structure section in **Guiding Principles** on page 9). Trees can be found at many different ages and irregular clusters, and do not necessarily have straight trunks or uniformly shaped canopies. In fact, leaning and jagged trunks can often be the most interesting feature in the landscape.

A mixed, densely planted ground cover layer, composed of plants with complementary above ground and below ground growth habits, will be far more successful at inhibiting weed invasion than bark mulch. If succession of perennial bloom and contrasting foliage texture is considered in the plant materials used to create the ground cover layer, the design can suggest the diverse tapestry of our native plant materials and achieve an artistic and colorful composition, with dramatic seasonal variations.

The more available space on the site that is filled with plant material, the less opportunity there is for a weed to enter. Plants grow against each other, above each other and below each other. Even a one-metre tall meadow has a multi-layered structure that protects the area from invasive weeds.

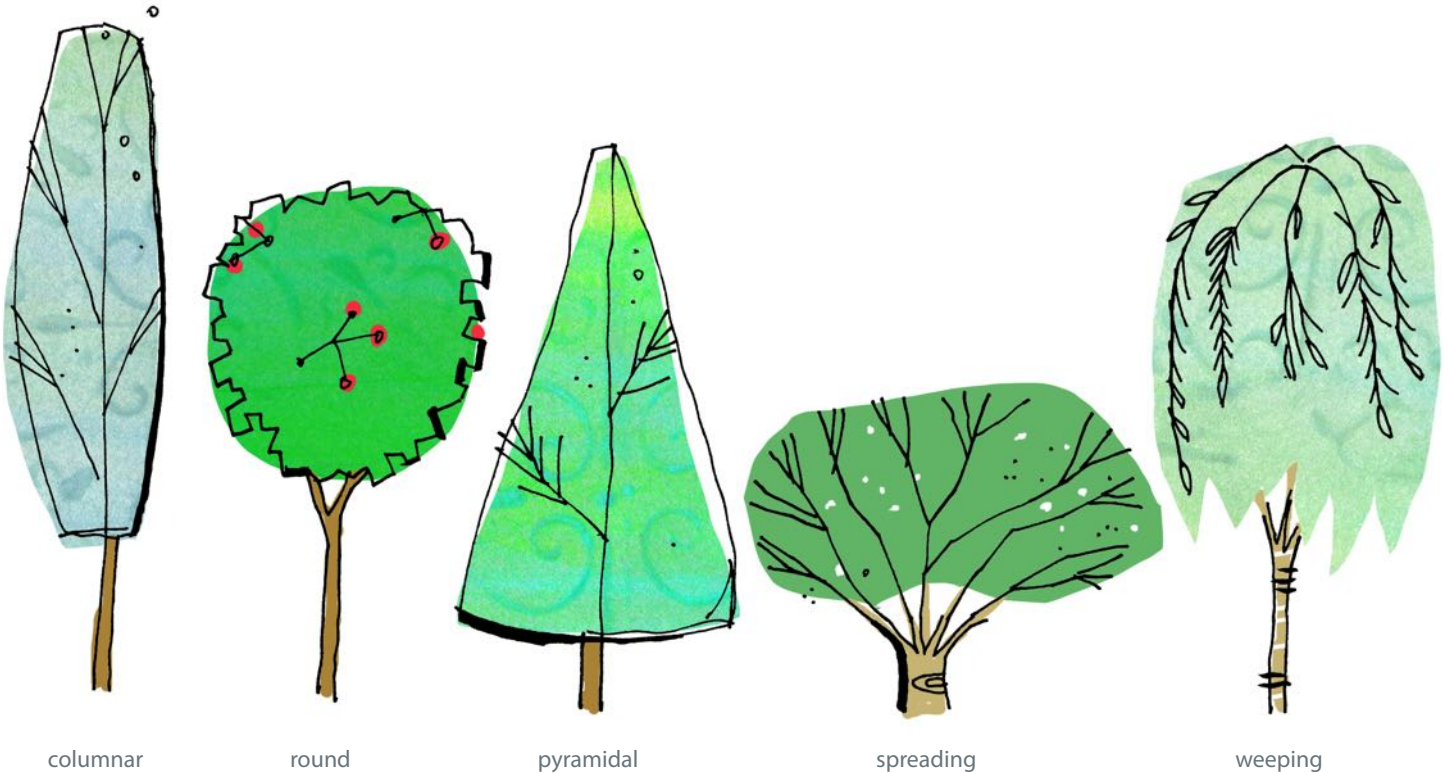
Some key points to consider when selecting plant material:

- Choose native (or native cultivars, a plant variety that has been produced by selective breeding) plants that will do well on the site under the existing site conditions as discussed previously
- Look for plant material that has been propagated from local seed sources. Plants grown from seeds found locally generally do better than imported plant materials.
- Research the growth habits of the plants. The mature height and spread, branching habits, blooming periods, and how they propagate will determine how much space to allow and what would make a good companion plant.

# Concept Planning

## **Logistics and Maintenance**

Consider how the site will be accessible not only to the public, but also to any future maintenance staff. Will there be room on the site to temporarily put equipment while the site maintenance occurs? Is there opportunity for expansion in the future if the project is popular? Is there room for people to circulate around the site while maintenance activities occur?




Trees in Calgary have a wide variety of branching habits.



# Concept Planning

In order to get a naturalization project implemented, a drawing package will need to be prepared for review and approval by the City of Calgary Parks. If the naturalization project is a community-driven initiative, people within the community can help prepare the approvals package.

 Discuss the project with the City of Calgary and determine if the services of a registered landscape architect will be necessary.

Generally, the plans will provide more detail into the elements on the site, such as types of materials, site slopes, locations of seating, pathways, or vertical elements. The package will document the background information, including community discussions, site history, and site analysis. The City of Calgary's Development Guidelines and Standard Specifications: Landscape Construction (refer to **Supporting Documents Appendix**) identifies several specific items, however at a minimum the

package should include:

## **Demolition**

What elements are being removed from the site?

## **Layout**

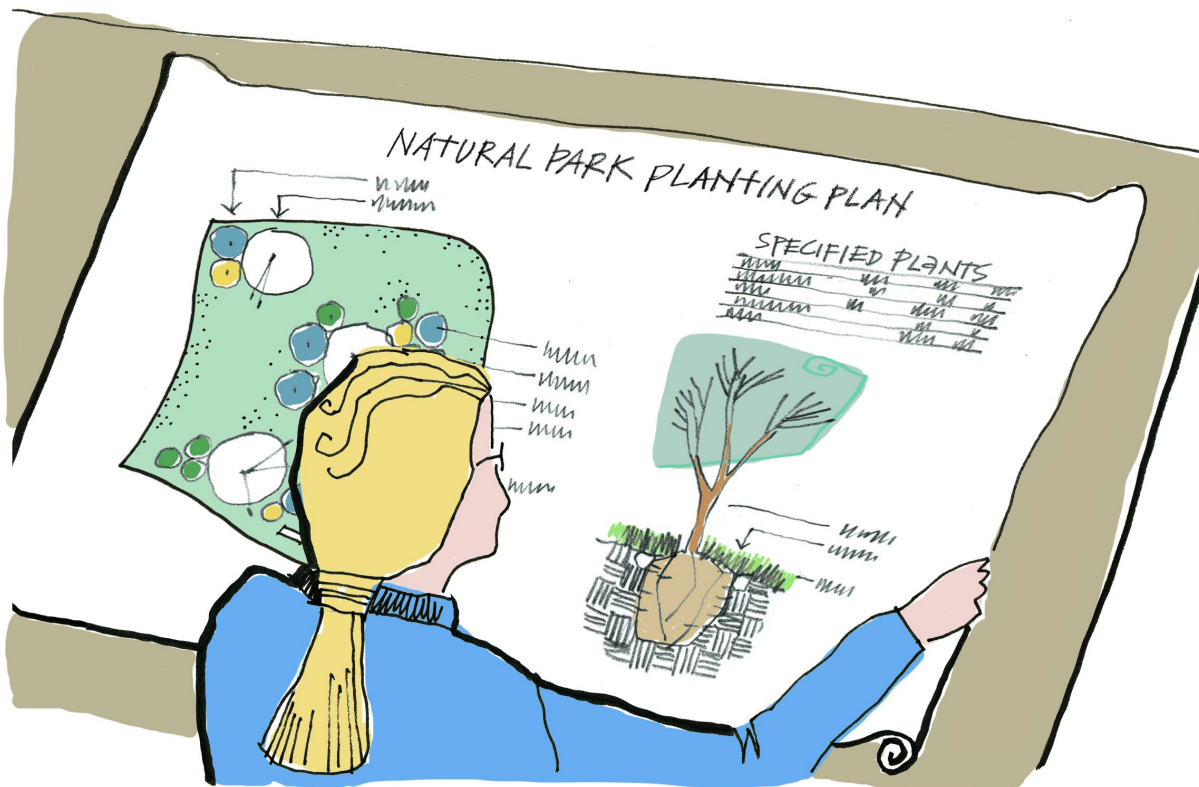
Identify the size and shape of the area, and provide layout dimensioning for any specific elements like fencing, trash receptacles, benches, or pathways.

## **Planting**

Identify the proposed tree and shrub species (conventionally by both common name and Latin/botanical name), size of the plants at time of planting, as well as any associated seed mixes.

## **Drainage**

When working with native materials, pay attention to which way the water is flowing on site. Efforts should be made to direct water towards a natural area to act as a water source to newly planted material.





# Detailed Discussions and Final Planning



Throughout the process, high level discussions with The City of Calgary should have already taken place. These informal discussions will be helpful in guiding the process. The City can provide insight and direction as the planning and design process progresses.

✔ With a concept plan in place, and discussions undertaken with the community, the final and most important step in this process will be detailed

discussions with The City of Calgary Parks. Formal approval from The City of Calgary on the project is key. As stewards of the land on behalf of citizens, discussions within The City will take place, which may result in changes to the proposed project. This is the point where The City will determine the timing of the project, discuss potential funding, construction strategies, and the level of City involvement needed for implementation. A final plan for the naturalization project will then be created.

# Implementation and Construction

The construction aspect of a naturalization project can vary depending on the size and the approach. Some projects could be constructed with a group of engaged volunteers and sufficient supplies, tree and shrub planting for instance. Larger areas requiring a more intensive site preparation would be better accomplished by a skilled contractor and the appropriate machinery.

An important factor in projects of this nature is the site preparation. Similar to building a house, the project needs a solid foundation which primarily encompasses creating a good soil base. A good soil base will increase the success of the establishment of the plant material, which is the heart of any naturalization project.

When embarking on the construction phase, efforts should be made to direct rainwater towards the naturalized area. Additional watering will be required during the establishment period for the plant materials in order to ensure adequate root system development. Generally, this establishment period is typically two growing seasons. After this period of time, the plant should have sufficient

root growth to enable it to survive for the life of the project and not require any supplemental irrigation. Keep in mind that during the early years, the site will not look like an established natural space. To the uneducated eye, it may appear desolate or even ugly. Naturalization projects take time.

It is anticipated that most sites identified for a naturalization project will have existing vegetation present. This will necessitate the removal of the non-native or invasive vegetation in order to prevent them from taking over the site. Removing the existing grasses from the area to be naturalized is recommended, especially if there is an infestation of smooth brome or other invasive species in the area. Depending on the size of the site, this can be a fairly intensive undertaking. This may encompass excavating the site, application of herbicides to control the invasive plants, or a controlled burning of the area to remove the undesirable species.



If any of these methods are a consideration, there should be coordination with The City. Utilizing the services of a professional landscape contractor is recommended.









# Naturalization Techniques

*This section is a cursory overview of on-site establishment and management techniques. They are examples of what a naturalization project might look like on site in a community.*

This section includes two parts: Establishment Techniques and Management Techniques. Establishment Techniques provides specific implementation strategies for creating a naturalized landscape in an existing green space. These strategies include natural regeneration, low-mow, managed succession, and soil building. Management Techniques

outlines the process of caring for a naturalized landscape. This includes information on site monitoring, strategic mowing, and weed control.



Speak with The City of Calgary to determine the amount of municipal or professional assistance required for each specific project.

# Establishment Techniques


*This section outlines examples of specific on-site strategies for creating a naturalized landscape in an existing green space.*

## Introduction

The previous research and the site analysis outlined in **Steps to Naturalization** (refer to page 21) are key factors in determining the type and success of the naturalization techniques which could be implemented within the park.

Following are some typical examples of how a naturalized landscape can be created in an existing park. The methods briefly described here should provide some insight as to how retrofitting of the park space will ultimately be carried out. These methods may be applied individually, such as natural regeneration, or used in combination with each

other, such as cultivation with reseeding. Generally, the scope and scale of the project will determine the appropriate naturalization method.

 Choosing the right naturalization method can be a complex decision, depending on the existing ecological conditions of the site, as well as the desired outcome. The City can determine if professional assistance is needed.

## Natural Regeneration

Natural regeneration, basically, is leaving the site alone. However, the project must convey design intent; it must be clearly understood by the public that there is a guiding hand behind the naturalization efforts. Natural regeneration is a legitimate site management practice, but the emphasis on maintenance of the site will be high. Litter collection and weed management will be paramount to ensure the site does not appear to have been abandoned. Site signage and dissemination of information to residents will also be quite important.

The technique of natural regeneration is perhaps the most straightforward, cost effective, and easiest to initiate. It works best on those sites within proximity to existing natural areas. Ensuring a distinct border, like a cleanly-mowed edge or fence, is a good way to illustrate the design intent behind the naturalization project. The main caveat with this technique is time; it does take a significantly longer time to establish over other naturalization techniques that introduce native plants back into the site.





## Low-Mow



Low-mow landscapes require reseeding and infrequent (annual or several times a year) mowing. Reseeding is applying thin layers of topsoil and reseeding manicured areas with an area-specific seed mix. A new seed mix will gradually transition a manicured area into a naturalized area. A proposed seed mix must be customized to the particular site's microclimate and exposure (refer to **Site Analysis** on page 22). It should be prepared by a professional Agriologist, Ecologist, or Landscape Architect.

The goal of low-frequency mowing is to protect native herbaceous plants and grasses from woody undergrowth invasion. Refer to **Strategic Mowing** on page 40.



mowed area

naturalized area

The species growing in most existing manicured areas in Calgary is Kentucky bluegrass (*Poa pratensis*). This is considered a turf monoculture (the cultivation of a single species in one area). Replacing existing Kentucky bluegrass with a native fescue sod is another method of naturalizing a site. This is a more intensive approach, but results in a quicker transition period when compared with reseeding.

# Naturalization Methods

## Soil Building

Soil is a key element in a naturalized landscape (refer to the Structure section in **Guiding Principles** on page 9). Healthy soil, a good foundation, results in plant growth and long term success of the naturalized landscape. Attention to the health of the soil is vital.

Tillage (also known as cultivation) is the technique of plowing or turning over the soil. To help reduce weed growth, till the soil to about a 30cm depth prior to seeding.

In order to provide cover to exposed soil and to prevent erosion, use groundcovers like bark mulch, compost, straw, or cover crops. Although bark mulch provides instant cover to exposed soil while the naturalized landscape establishes, incorporation

of fast growing perennial cover crops are very effective. Deep-rooted vegetation species, like legumes or grasses, can improve drainage and water infiltration in the soil and also bring up nutrients from the subsoil. Legumes like clover and vetch, which can be controlled by mowing, host bacteria that add nitrogen into the soil for uptake by plants. Vegetation with rapid growth can increase organic matter in the soil through regeneration and renewal, prevent nutrient loss from the system, and act as weed suppressants.

✓ If you want to ensure the proper alkalinity or acidity (soil pH) and nutrients are present, talk to The City of Calgary about soil testing from a laboratory. Checking for bugs is important - they are a sign of healthy soil.



# Naturalization Methods



## Managed Succession

Managed succession involves an active planting of native trees, shrubs, grasses, and perennials on the site to gradually transition the area away from a turf monoculture (the cultivation of a single species in one area). Managed succession modifies the rate at which the site transitions to a natural landscape. This technique is often the most familiar, since it parallels standard practices of establishing a garden. Establishing the structure of the landscape (refer to

the Structure section in **Guiding Principles** on page 9) is especially important in a managed succession approach.

In this particular method, the existing turf area would remain in place, and the natural plants would be introduced to the site and cultivated to eventually succeed the Kentucky bluegrass and transition the area into a more natural landscape.



# Management Techniques

*This section outlines management techniques for caring for a naturalized landscape.*

## Introduction

In most cases, The City of Calgary will assume stewardship over the newly naturalized park space. These management techniques are intended to provide some background for discussion and follow up over the course of the vegetation establishment on the site.



Talk with The City to discuss their expectations and to plan their involvement in site management.

## Monitoring

Generally, the maintenance of the site will be the most intense during the first two years after construction, while the plant material establishes itself and fills in. In this period, the area is highly susceptible to weed invasion.

Watering of the plant materials should also be tapered off after the two-year establishment period. Additional inputs of water and nutrients reduces the plant's ability to withstand periods of stress, like droughts. A durable landscape that isn't dependent on additional inputs to sustain itself is the ultimate goal of a naturalization project.

There are other maintenance practices such as controlled burning or tillage, but they are best

conducted on large sites and under the direct supervision of The City.

The following sections discuss monitoring and maintenance in more detail.

- All projects should be monitored and evaluated so that lessons learned can be incorporated into future projects
- Conduct regular observations on site to determine which plant species establish themselves best and where within the site
- Engage with the community for feedback on reaction to the project
- Monitor invasive plants
- Assess health of native plant communities

## Strategic Mowing

During the first two years after the landscape has been constructed, actively mowing any grasses or perennials in the fall with hand held equipment like a weed whipper, will enable those plants with seed heads to obtain better contact with the soil base.

In the first year, observation of the growth of desired species and weed competition is essential when making maintenance decisions. When weeds grow to 30–40 cm tall, mow to no less than 15cm high (with a mower or weed eater) to prevent the weeds from going to seed. Generally, native plants will grow more extensive root systems than tops in the first year; therefore, mowing to 15–20 cm high will

not hurt them. This allows sunlight to reach desired species. Leaving the cutoff, or stubble, in place over the winter creates snow traps and provides a bit more moisture to the root systems in the spring. Do not mow with a lawn mower, as mowing too close encourages weedy species.

During the second year, mow once, as close to the ground as possible, in early spring. This allows the soil to warm more quickly and young native plants to emerge. If mowing is postponed until early spring, birds and other wildlife can enjoy the native site during the winter.

## Weed Control

One of the best management practices for an establishing natural landscape is weed control. Weeds are unwanted or invasive plants that are in competition with cultivated and native plants. Weeds, as mentioned earlier, will show up in a newly established landscape due to the healthy soil.

Incorporating the practices examined earlier, allowing adequate spacing for the plant materials, and establishing a dense groundcover crop will help to mitigate the intrusion of weeds into the naturalized area.

However, good, fertile soil will consistently produce weeds. There will be a small seed bank within the

soil and any airborne seeds will establish in any exposed areas of fresh soil. Frequent weeding of the naturalized area will be required during the first two years of establishment to keep the weeds from out-competing the natural vegetation, which is slower growing.

If you have a weed problem, mow, hand pull or hoe weeds. Talk to a gardening expert.



If the problem is severe, you might consider using herbicides. Be sure to talk to The City beforehand, so they can refer you to an expert and tell you how to use products safely.







# Local Initiatives

*This section presents a schematic naturalization design for several high-profile areas along Memorial Drive.*

The following section contains a site-specific sample project to demonstrate the site analysis and conceptual design techniques outlined in the previous chapters.

This is a demonstration project. As the project progresses, community engagement and public engagement will be key.

# Naturalizing Memorial Drive

## Site Analysis

### Site Context

The project site consists of a series of prominent green spaces along Memorial Drive. The general extent of scope are the Bow River pathways on the south, and the road right-of-ways on the north. The underground utility right-of-ways and underground infrastructure were noted for each area.

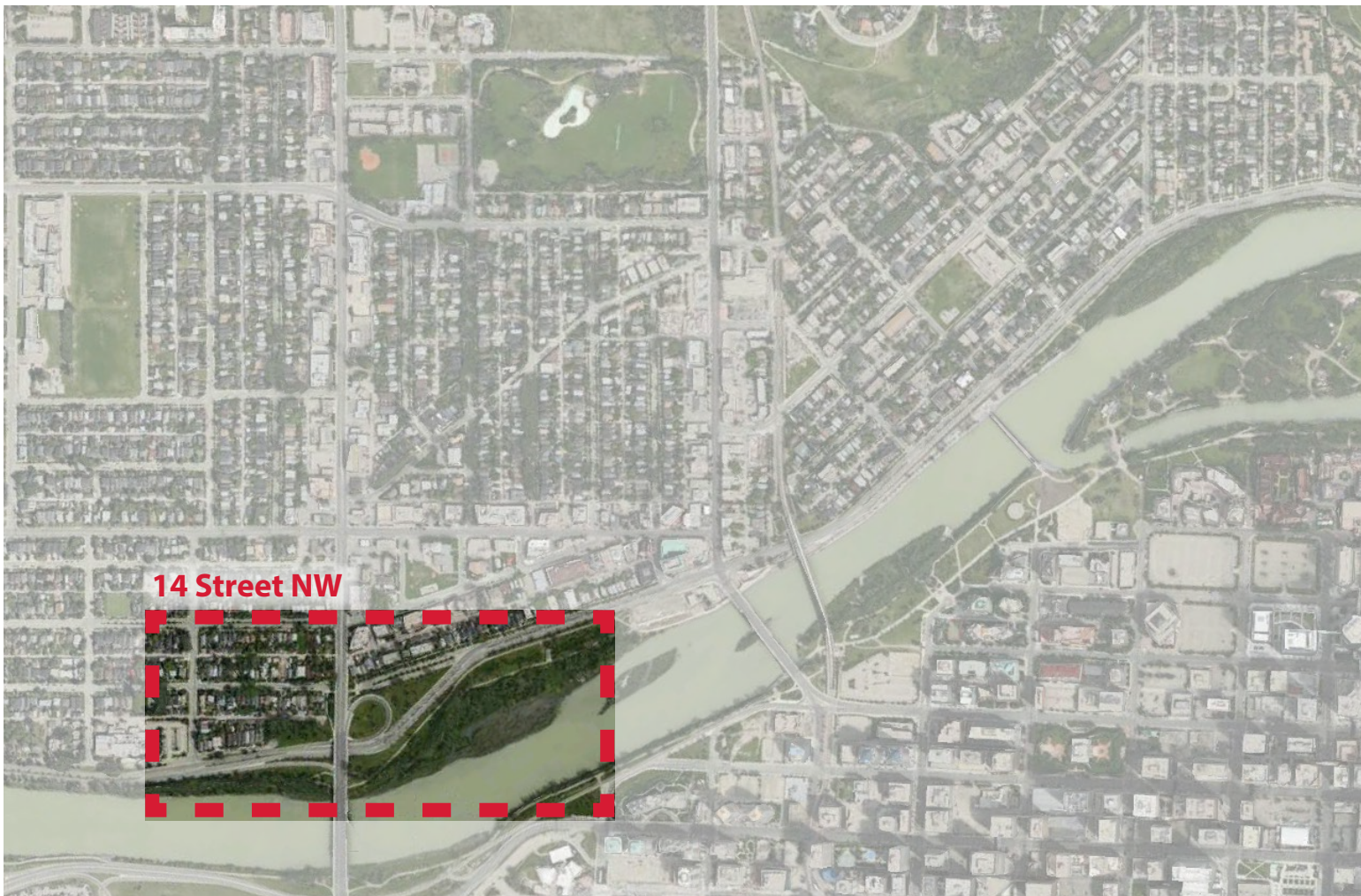
### Site Character

Nestled along the edge of the Bow River in Calgary, Memorial Drive serves as a major corridor for many modes of transportation, including vehicular, bicycle, and pedestrian. Tree lined edges mark the corridor as

a civic monument to war and military sacrifice. The majority of the site consists of manicured turf grass.

### Site History

The site has long existed as a high-visibility area, from early First Nations trail systems and early Fort Calgary settlements, to Canadian Pacific Railway and Dominion Government land ownership. The development of adjacent floodplain communities (primarily residential) along the Bow River in the late 1800s is the foundation of the urban fabric that exists today. Memorial Drive is an important part of Calgary's cultural landscape.



Memorial Drive Naturalization project areas (Map data © 2016 Apple).





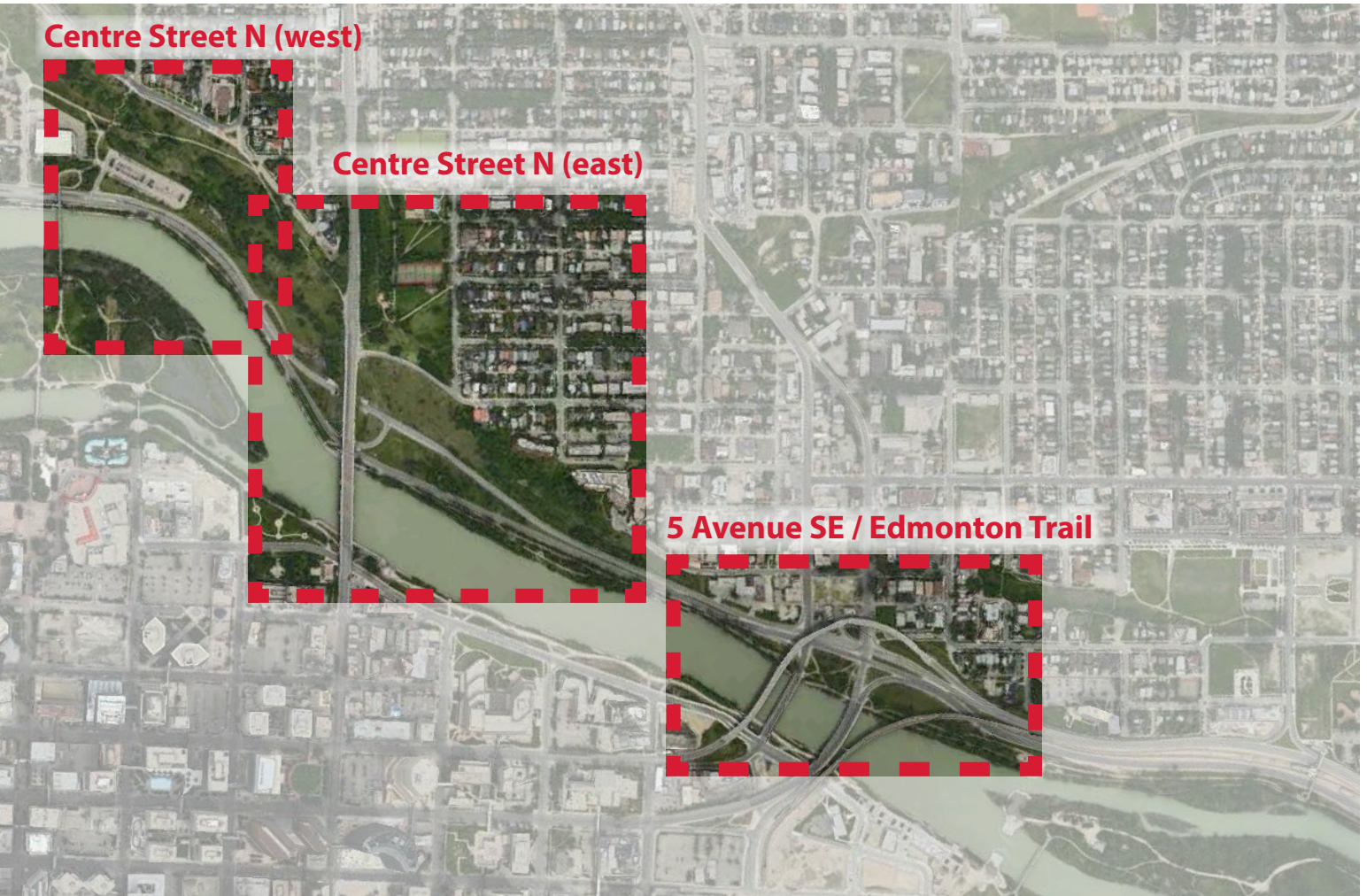
Near the 14 NW Street bridge



Looking east from the Crowchild Bridge



Just east of the 14 Street NW bridge



**Centre Street N (west)**

**Centre Street N (east)**

**5 Avenue SE / Edmonton Trail**



# Naturalizing Memorial Drive

## Site Analysis

Dominant plant species identified along Memorial Drive include:



Kentucky blue grass (and thistle)



Yellow goat's beard



Alfalfa



Leafy spurge



Wormwood



Red osier dogwood



Schubert chokecherry



Honeysuckle



Showy mountain ash



Saskatoon berry



Trembling aspen



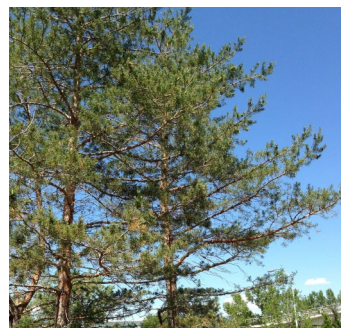
Balsam poplar



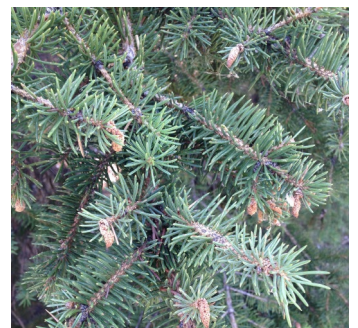
Bur oak



White elm



Scots pine



Colorado blue spruce



# Concept Planning

## Design Intent

The inspiration for the concept came during the site analysis, from a review of the Bow River’s historical floodplain extents. Based on 5, 10, 20, 50, and 100-year flood inundation plans, the actual flood extents define the extents of the seed mixes. The angular shapes of the seed mixes, combined with heights of plant material and colour blooms, will create distinct borders for pedestrians and drivers to see. The seed mixes respond to the physical demands of the site (drainage, sunlight, erosion control, road maintenance) and also reinforce the riparian identity of the project along the Bow River.



Historical flood plain districts (Department of Agriculture, 1968)

## Plant Mixes Legend

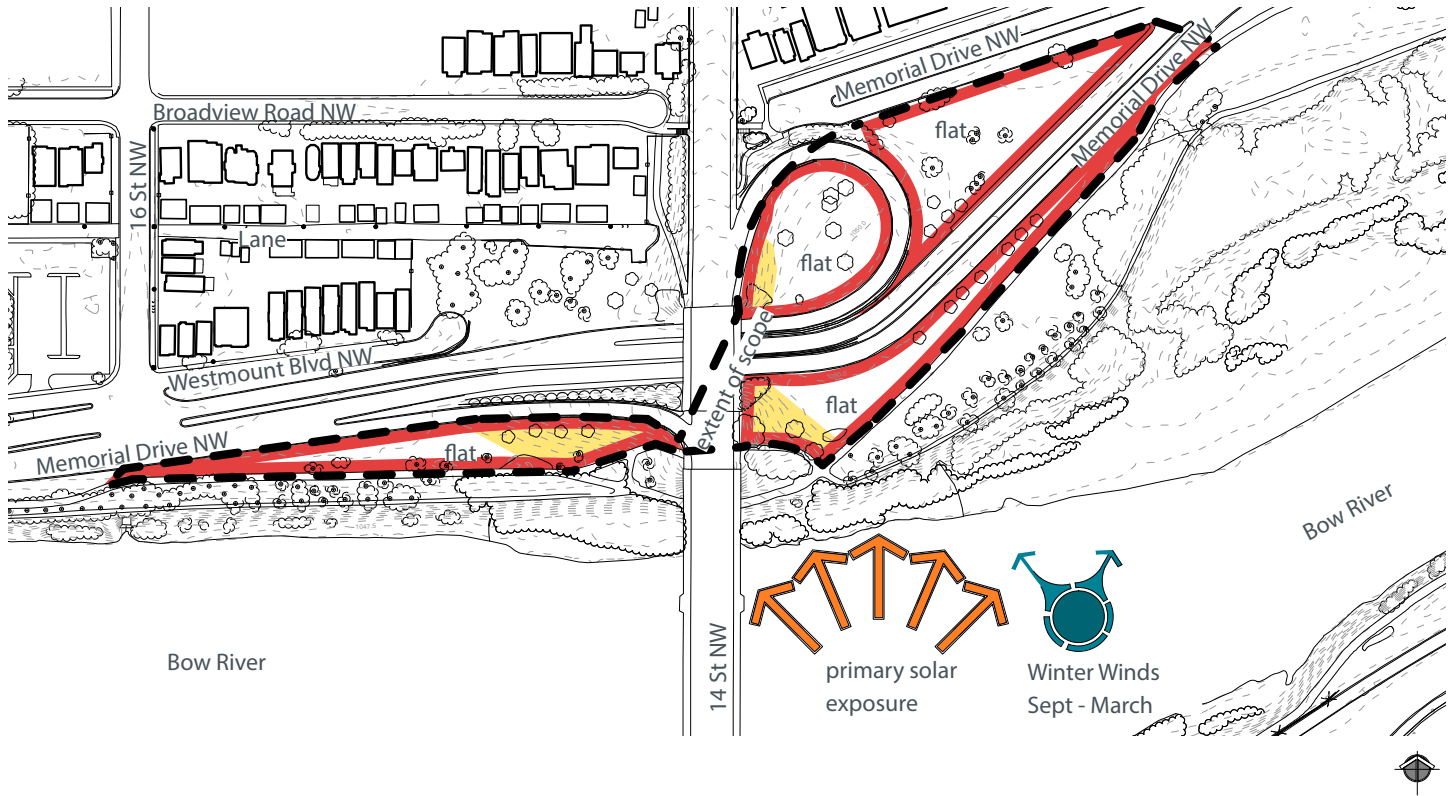
<p><b>Roadside edges mix</b></p> <ul style="list-style-type: none"> <li>Western wheatgrass</li> <li>Green needlegrass</li> <li>Northern wheatgrass</li> <li>Canada wildrye</li> <li>Blue grama</li> <li>Junegrass</li> <li>Needle and thread</li> <li>Mountain bromegrass</li> <li>Alkalai cordgrass</li> <li>Buffalograss</li> <li>Switchgrass</li> <li>Inland saltgrass</li> </ul>	<p><b>Full sun seed mix</b></p> <ul style="list-style-type: none"> <li>Fringed bromegrass</li> <li>Alpine bluegrass</li> <li>Mountain bromegrass</li> <li>Violet wheatgrass</li> <li>Sheep fescue</li> <li>Western wheatgrass</li> <li>Flow bluegrass</li> <li>Sloughgrass</li> <li>Junegrass</li> <li>Spike trisetum</li> <li>Tufted hair grass</li> <li>Canada bluegrass</li> <li>Ticklegrass</li> <li>Bluejoint</li> <li>Fowl bluegrass</li> </ul> <p><b>Full sun shrubs</b></p> <ul style="list-style-type: none"> <li>Buffaloberry</li> <li>Prickly rose</li> <li>Bebb willow</li> <li>Gooseberry</li> <li>Cranberry</li> </ul> <p><b>Full sun trees</b></p> <ul style="list-style-type: none"> <li>Trembling aspen</li> <li>White spruce</li> </ul>	<p><b>Slopes seed mix</b></p> <ul style="list-style-type: none"> <li>Western wheatgrass</li> <li>Blue grama</li> <li>Canada wildrye</li> <li>American vetch</li> <li>Foothills rough fescue</li> <li>Slender wheatgrass</li> <li>Green needlegrass</li> <li>Alkalai bluegrass</li> <li>Sandberg bluegrass</li> <li>Junegrass northern</li> <li>Western wheatgrass</li> <li>Purple prairie colver</li> </ul> <p><b>Slopes shrubs</b></p> <ul style="list-style-type: none"> <li>Prickly rose</li> <li>Common rose</li> <li>Buffaloberry</li> <li>Lilac</li> <li>Saskatoon berry</li> <li>Common juniper</li> <li>Shrubby cinquefoil</li> <li>Gooseberry</li> <li>Hawthorn</li> </ul> <p><b>Slopes trees</b></p> <ul style="list-style-type: none"> <li>Lodgepole pine</li> <li>Trembling aspen</li> <li>Paper birch</li> </ul>	<p><b>Vibrant seed mix</b></p> <ul style="list-style-type: none"> <li>Purple prairie clover</li> <li>Pussy toes</li> <li>Columbine</li> <li>Yarrow</li> <li>Wild blue flax</li> <li>Red clover</li> <li>Rough cinquefoil</li> <li>Yellow avens</li> <li>Gaillardia</li> <li>Prairie coneflower</li> </ul> <p><b>Vibrant shrubs</b></p> <ul style="list-style-type: none"> <li>Prickly rose</li> <li>Buffaloberry</li> <li>Bebb willow</li> <li>Gooseberry</li> <li>Cranberry</li> </ul> <p><b>Vibrant trees</b></p> <ul style="list-style-type: none"> <li>Pincherry</li> <li>Chokecherry</li> </ul>	<p><b>Shade seed mix</b></p> <ul style="list-style-type: none"> <li>Sheep fescue</li> <li>Fringed bromegrass</li> <li>Foothills fescue</li> <li>Junegrass</li> <li>Bluejoint</li> <li>Western wheatgrass</li> </ul> <p><b>Shade shrubs</b></p> <ul style="list-style-type: none"> <li>Red osier dogwood</li> <li>Buffaloberry</li> <li>Gooseberry</li> </ul> <p><b>Shade trees</b></p> <ul style="list-style-type: none"> <li>Trembling aspen</li> <li>White spruce</li> <li>Paper birch</li> </ul>
--	---	---	--	---

# Naturalizing Memorial Drive

## Site Analysis - 14 Street

### Brief Site Description

These fragmented spaces contain manicured turfgrass, with mature trees and several shrubs scattered throughout. Adjacent to main roads, these areas are highly susceptible to salt spray.



### Legend

- road salt spray
- erosion susceptible slope
- existing trees and shrubs
- existing buildings
- scope of work



project location



# Concept Planning - 14 Street



**Legend** (refer to plant mixes legend on page 49)

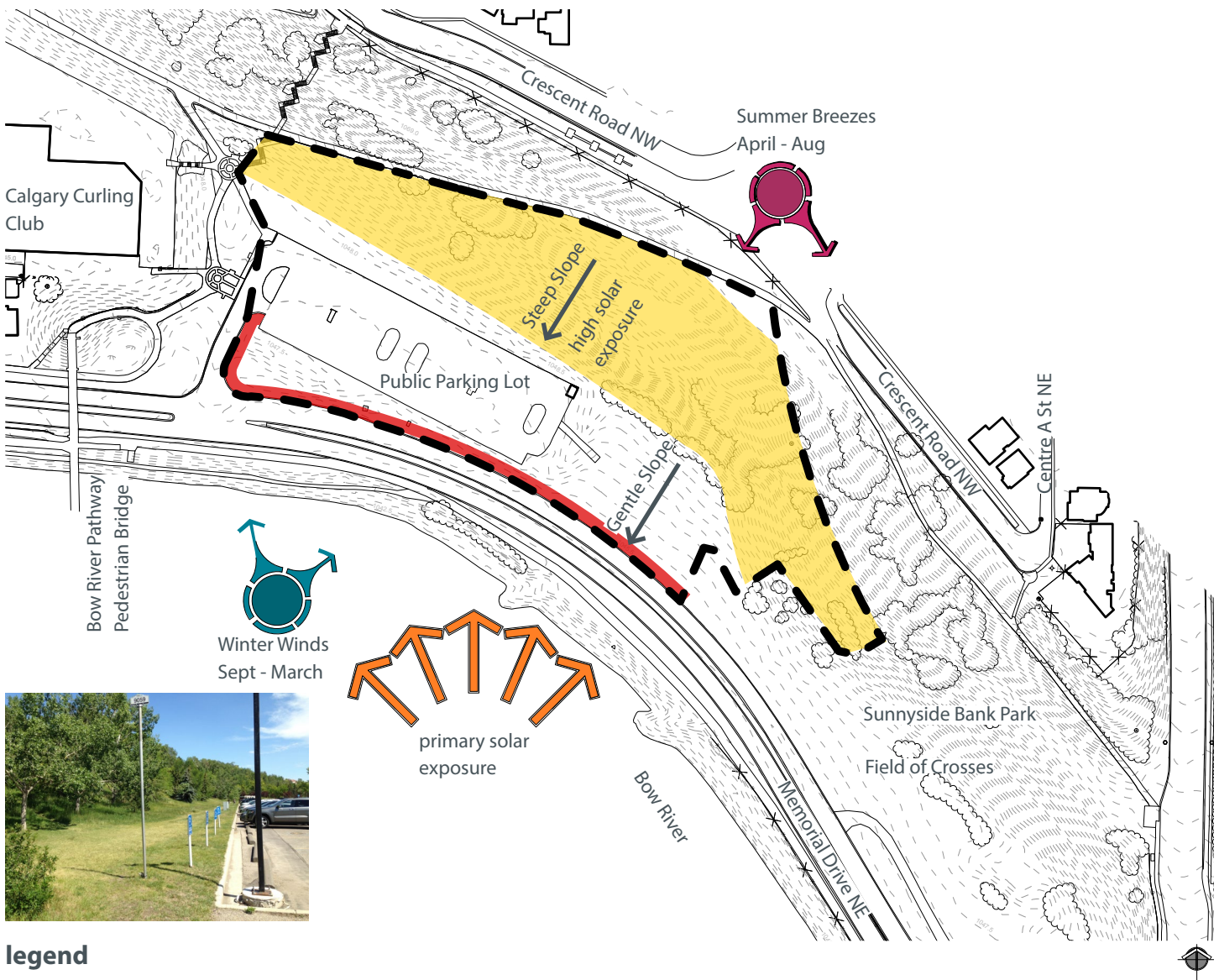
- |  |                     |   |   |
|--|---------------------|---|---|
|  | road side edges mix |  | proposed planting bed<br>• trees and shrubs |
|  | full sun mix        |  | existing trees and shrubs                   |
|  | slopes mix          |  | existing buildings                          |
|  | vibrant mix         |  | scope of work                               |

# Naturalizing Memorial Drive

## Site Analysis - Centre Street (west)

### Brief Site Description

This area is dominated by steep, south-facing slopes with strong solar exposure, especially during summer. This area borders the Field of Crosses, an annual memorial installation that will remain as manicured space.



### Legend

- road salt spray
- erosion susceptible slope
- existing trees and shrubs
- existing buildings
- scope of work












project location

## Concept Planning - Centre Street (west)



**Legend** (refer to plant mixes legend on page 49)

	road side edges mix		proposed planting bed • trees and shrubs		existing buildings
	full sun mix		existing trees and shrubs		scope of work
	slopes mix				
	shade mix				

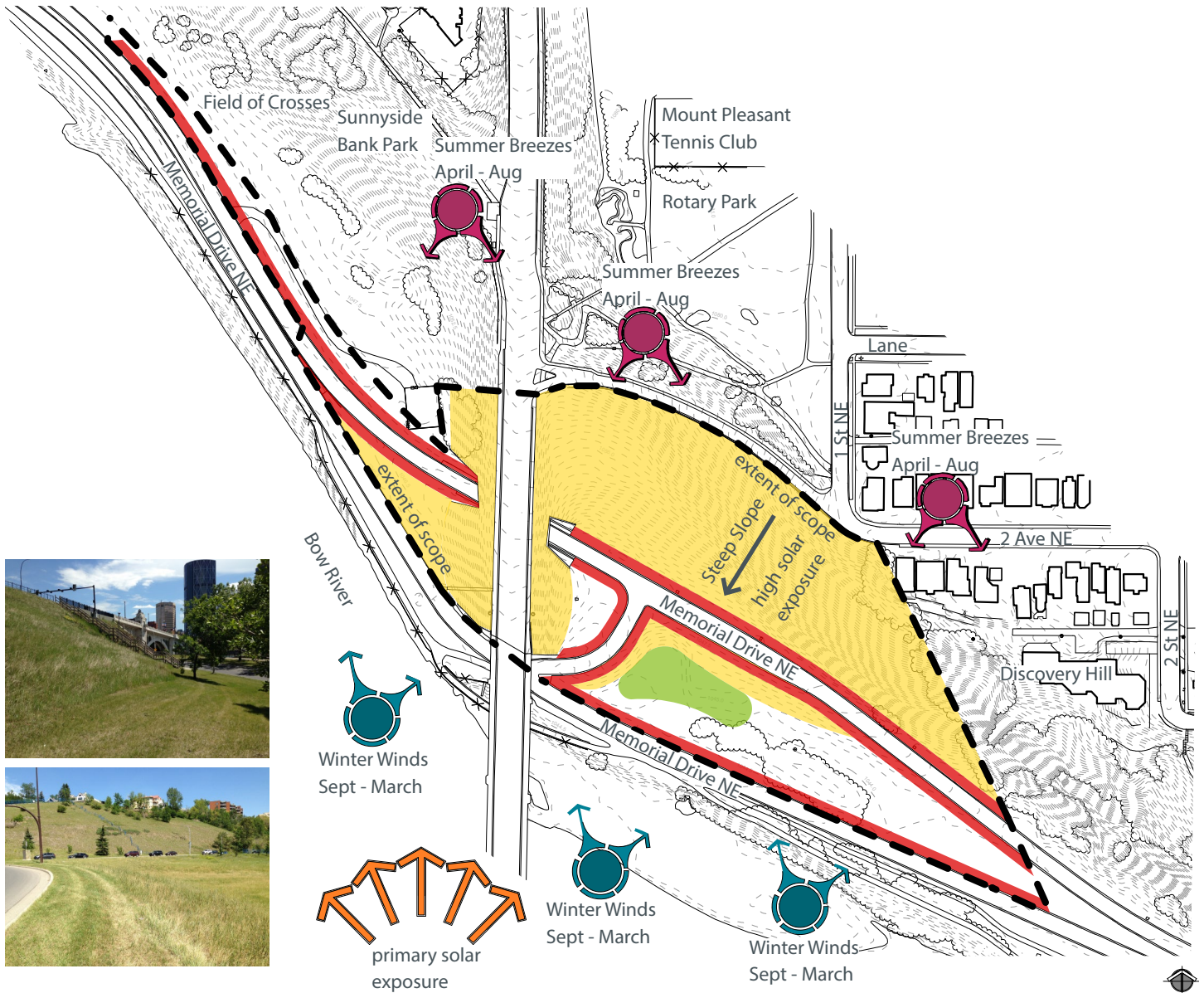


# Naturalizing Memorial Drive

## Site Analysis - Centre Street (east)

### Brief Site Description

Steep, unmowed slopes from the iconic Centre Street Bridge, as well as the natural bluff to the north, lead down to fairly flat, manicured space. The Field of Crosses, to the north west, will remain as manicured space.



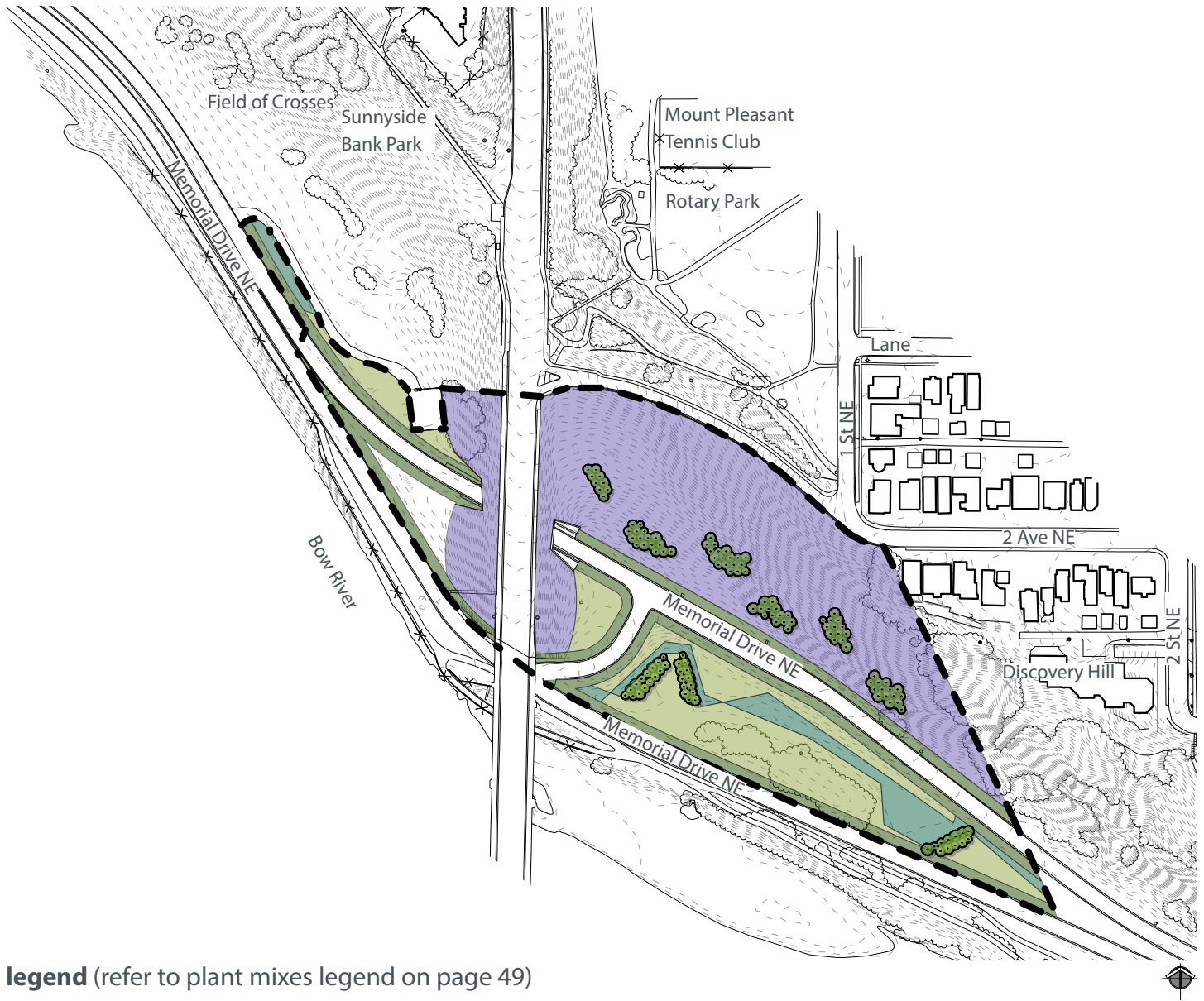
### Legend

- road salt spray
- erosion susceptible slope
- moist and low area
- existing trees and shrubs
- existing buildings
- scope of work

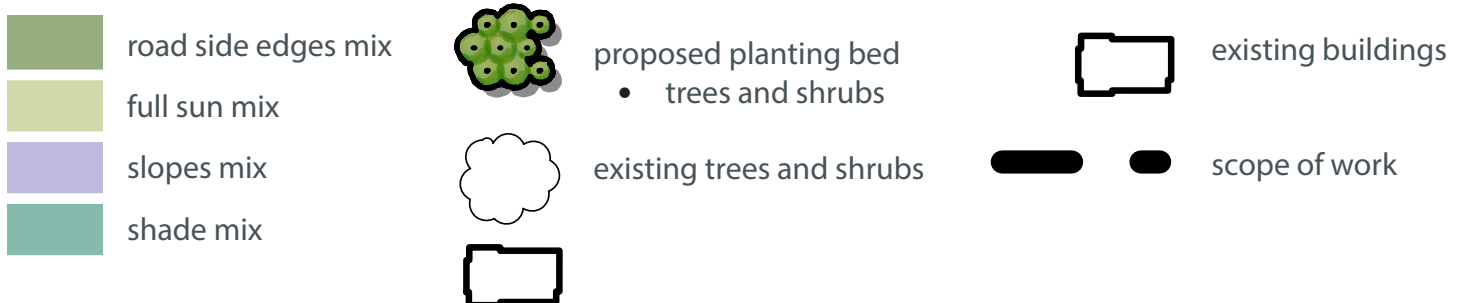


project location

## Concept Planning - Centre Street (east)



**Legend** (refer to plant mixes legend on page 49)



# Naturalizing Memorial Drive

## Site Analysis - 5 Avenue

### Brief Site Description

This area is relatively flat, although the green spaces are highly susceptible to salt spray due to the numerous overpasses, bridges and high number of lanes. The area is along a high-profile commuter route into downtown Calgary.



### Legend

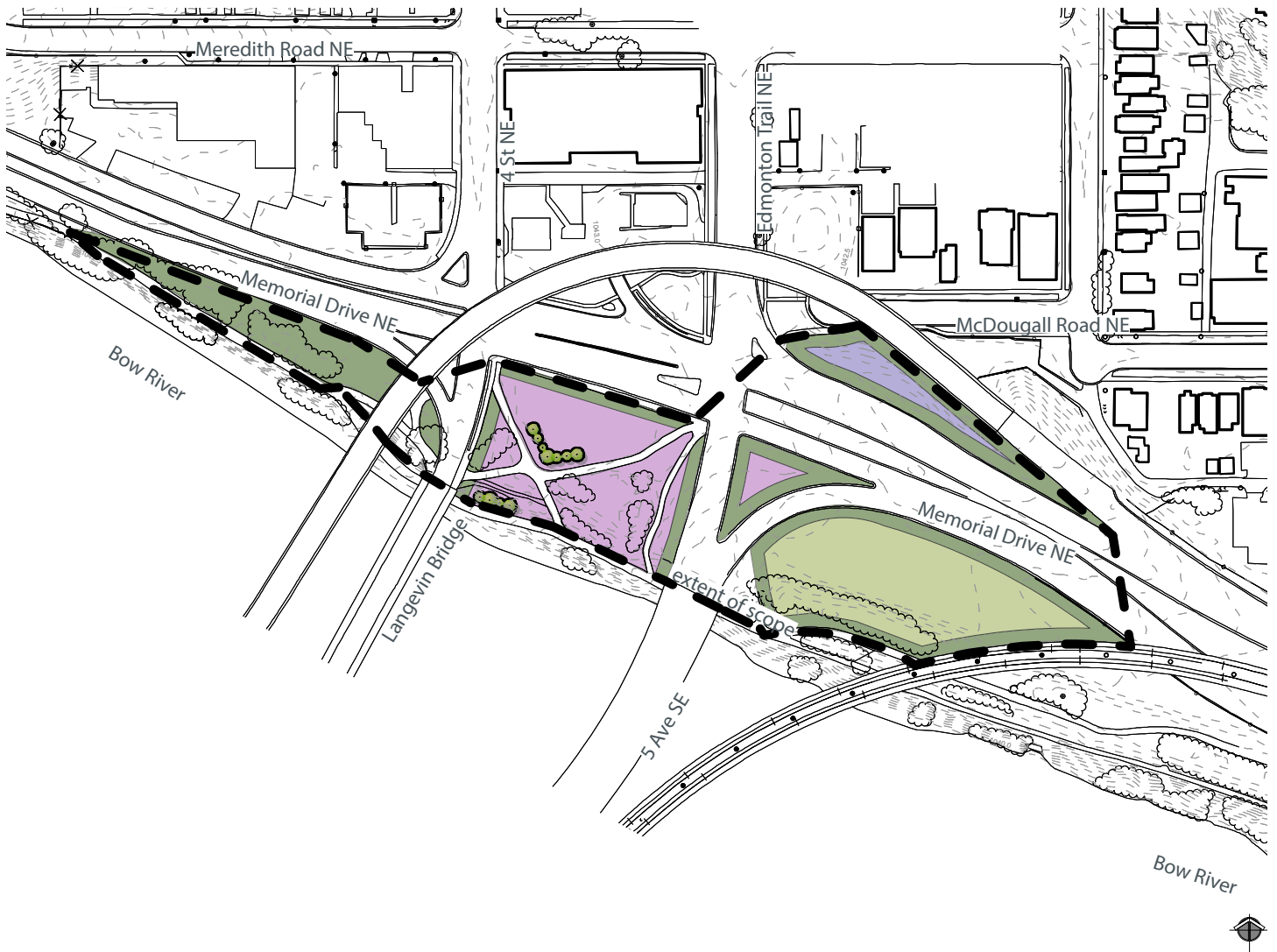
- road salt spray
- existing buildings
- existing trees and shrubs
- scope of work
- existing buildings












project location



# Concept Planning - 5 Avenue



## legend

	road side edges mix		proposed planting bed • trees and shrubs		existing buildings
	full sun mix		existing trees and shrubs		scope of work
	slopes mix				
	vibrant mix				



# Conclusion

*This section provides several parting tips, suggestions, and words of advice to help with the naturalization process.*

From aspen parkland to rolling foothills, the parks and open space in Calgary hold, for many, a powerful and valued place within the city. This is the driver for a carefully-crafted naturalization project. Cultivate interest and enthusiasm throughout the community. Use both personal and collective energy to garner support for a local project. Focus on the vision that puts the community first.

It is important to realize that naturalizing a site doesn't happen overnight. Naturalization projects set things in motion, and can take several years to become fully established vegetation communities that add beauty to the landscape. So be patient.

The **Supporting Documents Appendix** provides a brief list of further resources. They will help piece together an understanding of City goals, practical guides, and federal policies.

Inspiration, information, and stories are available from many different groups and organizations. Look for similar communities and professionals with knowledge of what works and what doesn't. Naturalists, ecologists, agrologists, and landscape architects can share with you much of their invaluable knowledge.

Although it is hoped that this guide provides an introduction to naturalization, reading a document is no substitute for hands-on experience. It is important to walk the parks and open space in Calgary, to visit the natural areas, and to meander through coulées and over hills. With patient observation, begin to cultivate a deeper understanding and respect for Calgary's regional landscape.

For more information on the Naturalization Initiative, visit [calgary.ca/parks](http://calgary.ca/parks) or call +311.





# Acknowledgments

*Thanks and appreciation.*

The completion of this project included invaluable input from The City of Calgary Parks, Urban Conservation, along with the following external assistance from:

**818 studio ltd.**  
[www.818studio.ca](http://www.818studio.ca)

**Kirsten Horel**  
[www.kirstenhorel.weebly.com](http://www.kirstenhorel.weebly.com)





# Appendices

*This section includes supporting documents and resources that provide additional information on naturalization and its related processes.*

## **Supporting Documents**

### **Plant Material Resources**

*Seed Mixes*

*Plant Material Nurseries*

## **Image Sources**

# Supporting Documents

The naturalization strategies set out in this document build upon existing guidelines and reports that outline planning strategies for Calgary's parks, open spaces, natural areas. For further details on a specific topic, please refer to the documentation listed below. Click a **hyper-linked title** to go to the specified document on the Internet (opens a webpage).

## **Urban Naturalization in Canada: A Policy and Program Guidebook (2001)**

**Author:** Evergreen [non-profit environmental organization]

**Focus:** A guidebook developed to assist land-use planners, park managers, landscape architects, ecologists and other professionals who work with the public at the municipal level to incorporate naturalization into their official plans, policies, environmental programs and operating procedures.

## **Open Space Plan (2003)**

**Author:** City of Calgary, Calgary Parks

**Focus:** A comprehensive municipal policy document on open space, developed to guide The City's acquisition, development, and use of open space.

## **Habitat Restoration Project Framework (2014)**

**Author:** City of Calgary, Calgary Parks

**Focus:** A municipal document that provides detailed requirements and guidelines for conducting and reporting on habitat restoration projects in existing and future natural environment parks that have, or will be, undergoing site disturbance.

## **Biodiversity Report (2014)**

**Author:** City of Calgary, Calgary Parks [in partnership with] Local Action for Biodiversity (LAB) Programme

**Focus:** A status quo assessment of biodiversity and its management in Calgary, and a discussion of current preservation and reclamation strategies in Calgary.

## **Our BiodiverCity: Calgary's 10-year Biodiversity Strategic Plan (2015)**

**Author:** City of Calgary

**Focus:** A municipal plan to protect, develop, and manage parks and ecosystems. It acts as a framework for City staff to foster more resilient, biologically diverse open space and neighbourhoods.

## **Natural Area Management Plan (1994)**

**Author:** City of Calgary, Parks and Recreation

**Focus:** A municipal strategy and policy plan to establish natural area management techniques, to ensure the long term viability, and to support appropriate public use of Calgary's natural environments.

## **Development Guidelines and Standard Specifications: Landscape Construction (2013)**

**Author:** City of Calgary, Calgary Parks

**Focus:** A municipal manual to provide technical instructions that are considered to be normal practice for the construction of landscape elements.

## **Engage Framework and tools (2013)**

**Author:** City of Calgary, Engage

**Focus:** A document outlining how the City's commitment to public engagement will be carried out, how it will be resourced, and how accountability will be managed.

### **Calgary's Plan for Long Range Urban Sustainability (2006)**

**Author:** imagineCalgary, City of Calgary, Office of Sustainability

**Focus:** A shared, 100-year vision, outlining 114 targets. It was created as a City-led, community-owned initiative.

### **Municipal Development Plan (2009)**

**Author:** City of Calgary

**Focus:** A 60-year vision and statutory plan that sets goals for the pattern of growth and development in Calgary.

### **Imagine Parks (2015)**

**Author:** City of Calgary, Calgary Parks

**Focus:** A 30-year vision that sets the overall strategic direction for the development and management of public parks and open space in Calgary.

### **Restoring Canada's Native Prairies: A Practical Manual (1995)**

**Author:** John P. Morgan, Douglas R. Collicutt, Jacqueline D. Thompson

**Focus:** A set of guidelines intended to provide a framework for anyone wishing to restore an authentic native prairie community on a site which no longer supports one, from a backyard to many hectares.

### **Canada's Plant Hardiness Zones (2014)**

**Author:** Natural Resources Canada

**Focus:** A map of Canada showing the the different zones where various types of trees, shrubs, and flowers will most likely survive.

### **Invasive Plants in Alberta: Weed Factsheets (2014)**

**Author:** Growing Forward 2, Government of Alberta, Government of Canada

**Focus:** A set of three-page, easy to understand, documents outlining why invasive plants are a problem, which species to watch out for, and what individuals can do to help.

### **Common Weeds in Calgary (amended 2016)**

**Author:** City of Calgary

**Focus:** A webpage geared towards property owners with tips for preventing and controlling weeds, and a list of common noxious and prohibited weeds in Calgary.

### **Navigation Protection Act (1985, amended 2014)**

**Author:** Government of Canada

**Focus:** A federal regulatory document and law that requires approval for any works that may affect navigable waters in Canada.

### **Fisheries Act (1985, amended 2016)**

**Author:** Government of Canada

**Focus:** A federal regulatory document and law that contains conservation and preservation rules for the protection of fish habitat essential to sustaining freshwater and marine fish species in Canada.

### **Urban Naturalization For Green Spaces in The City of Edmonton, Alberta, Canada**

**Author:** Jaime Aguilar Rojas, University of Alberta

**Focus:** A joint research project on naturalized areas in Edmonton, focused on the effects of naturalization on living and non-living habitat.



# Plant Material Resources

## Seed Mixes

The preparation of seed mixes for specific areas is similar to creating a cooking recipe from scratch. Ingredients, in this case seeds, are blended together based on the qualities that work best for the site and soil conditions. This would be called a 'custom blend'.

There are also basic or standard blends that can be used as a starting point. The seed mix is applied to the site, and then... wait. There typically is some tweaking to the mix, overseeding with an alternate seed type to adjust for any seeds that did not germinate.

Seed mixes are typically calculated on a percentage basis for the entire mix. Application rate for the seed mix is also important when ordering seeds. A sales representative from a seed supplier can help determine the correct application rate, if you can provide the size of the project site. Typically, the rate is stated in terms of weight of seeds per unit area,

and is usually expressed in kilograms per hectare.

Below are some species for consideration in naturalization projects in Calgary (listed in alphabetical order).

### Dry Areas:

Alkali bluegrass  
Blanket flower  
Candle anemone  
Green needlegrass  
Junegrass  
Northern sweetvetch  
Northern wheatgrass  
Prairie crocus  
Purple prairie clover  
Silvery lupine  
Slender wheatgrass  
Western wheatgrass  
Yarrow

### Wet Areas:

Awned wheatgrass  
Fringed brome grass  
Fowl bluegrass  
Harebell  
Junegrass  
Low goldenrod  
Mountain brome grass  
Slender cinquefoil  
Sloughgrass  
Ticklegrass  
Tufted hairgrass  
Old man's whiskers  
Wild bergamot

## Plant Material Nurseries

There are many seed suppliers within proximity to Calgary. While these suppliers and nurseries provide product for a number of construction and reclamation professions, some will provide seed to community groups and homeowners. An online search for 'seed suppliers Calgary' will produce a wealth of results. Reviewing the search results will provide insight as to which organization would be best suited to be a source of seeds.

The best quality plant material is local material. The closer the nursery is to the project site, the better.

The **Landscape Alberta Nursery Trades Association** is a voluntary trade association for businesses in the green industry across Alberta. They have an extensive **Membership Directory**, including plant material nurseries.



# Image Sources

All images and photographs in this document belong to The City of Calgary unless otherwise specified below:

## Page 14

Tree planting initiative

[https://www.edmonton.ca/city\\_government/initiatives\\_innovation/root-for-trees.aspx](https://www.edmonton.ca/city_government/initiatives_innovation/root-for-trees.aspx)

## Page 15

Terwillegar Drive

[www.edmonton.ca/city\\_government/initiatives\\_innovation/special-projects.aspx](http://www.edmonton.ca/city_government/initiatives_innovation/special-projects.aspx)

Twin Brooks

[www.twinbrooks.ca/index.php/mini\\_site/site/Nature/home.html](http://www.twinbrooks.ca/index.php/mini_site/site/Nature/home.html)

Government House Park

[www.edmonton.ca/city\\_government/initiatives\\_innovation/special-projects.aspx](http://www.edmonton.ca/city_government/initiatives_innovation/special-projects.aspx)

Government House Park

[www.makesomethingedmonton.ca/projects/506-edmontons-1st-river-valley-food-forest/](http://www.makesomethingedmonton.ca/projects/506-edmontons-1st-river-valley-food-forest/)

## Page 17

Birkmaier Park

[www.ecofriendlysask.ca/2013/03/nature-in-our-backyard-saskatoons.html](http://www.ecofriendlysask.ca/2013/03/nature-in-our-backyard-saskatoons.html)

Heritage Park

[www.ecofriendlysask.ca/2013/03/nature-in-our-backyard-saskatoons.html](http://www.ecofriendlysask.ca/2013/03/nature-in-our-backyard-saskatoons.html)

Woodland Walk, Heritage

[www.ecofriendlysask.ca/2013/03/nature-in-our-backyard-saskatoons.html](http://www.ecofriendlysask.ca/2013/03/nature-in-our-backyard-saskatoons.html)

## Page 19

Royalwood naturalized stormwater pond

[www.nativeplantsolutions.ca/our-work/royalwood/](http://www.nativeplantsolutions.ca/our-work/royalwood/)

Sage Creek new development with naturalized plantings and wetlands

[www.nativeplantsolutions.ca/our-work/sage-creek/](http://www.nativeplantsolutions.ca/our-work/sage-creek/)

Seine River naturalization and restoration

[www.winnipeg.ca/publicworks/parksOpenSpace/NaturalistServices/NaturalAreas/Habitat.stm](http://www.winnipeg.ca/publicworks/parksOpenSpace/NaturalistServices/NaturalAreas/Habitat.stm)

Crescent Drive Park - no mow zone beneath trees

[www.arch.umanitoba.ca/greenmap/pages/GM\\_DC\\_CrescPrk/pages/1.html](http://www.arch.umanitoba.ca/greenmap/pages/GM_DC_CrescPrk/pages/1.html)



**Page 47**

Map data © 2016 Apple

**Page 49**

Historical flood plain districts from (Department of Agriculture, 1968)

Taken from *Flood Plain of Bow River in the City of Calgary, Volume 2*, Water Resources Division in the Department of Agriculture, Alberta. February 1968.

