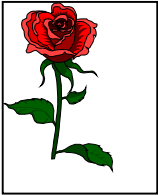


NATURESCAPES

**A New Approach for the Use of
Edmonton's School and Park Sites**

**Joint Use Agreement
Cooperating for Edmonton**

<p>Message From: City of Edmonton Community Services Edmonton Catholic Schools Edmonton Public Schools</p> <p><i>Naturescapes</i> is a powerful word. Taken in context of school and parks sites, <i>Naturescapes</i> have the potential to enhance and create new spaces for nature in the landscape, in our communities and in our lives.</p> <p>We hope that this Edmonton based guide will assist you in planning, implementing and maintaining your <i>Naturescapes</i> project. It contains a host of suggested ideas, resources and directions on how to get started.</p> <p>We hope to inspire you and support your journey in helping to build a greener Edmonton.</p>	<div data-bbox="1154 239 1310 432" style="text-align: right;">  </div> <p>To: General Public Elected Officials School Councils Community Leagues Land Developers Environmental and Special Interest Groups</p>
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1.0 INTRODUCTION

There is growing concern related to humankind's impact on planet Earth. Lost species and natural habitats, increasing greenhouse gas emissions, depleted natural resources – all are signs of a planet feeling the strains of urbanization. The demands of urbanization and population pressures, besides impacting the environment, are also affecting the quality of life.

Learning about our circumstances is creating an invitation for change. Edmonton's school children and community partners are responding to these environmental challenges with many different initiatives. These groups are involved in conserving woodland habitat, planting flower gardens and designing and constructing habitat for many kinds of animals and plants in outdoor classrooms. Community groups are also involved in redeveloping and enhancing sites to include a variety of landscapes in their neighbourhoods ranging from the natural and biologically diverse to aesthetically pleasing - all contributing to the livable community.

1.1 Purpose of the Resource Document

The purpose of this resource document is to help shape and support a city-wide program of alternative approaches to school and park site landscaping by providing information appropriate for the Edmonton region. It is about providing further opportunities to support the integration of *Naturescapes* projects on school and park sites through community action. A broad range of stakeholders will find the information useful, including, but not limited to: the public, elected officials, land developers, school administrators, parks maintenance staff, the Edmonton Federation of Community Leagues, school and community interest groups.

This resource document recognizes that each *Naturescapes* project will have its own strengths, limitations and evolution. Users are encouraged to explore numerous ideas before deciding what is most suitable for their site. These guidelines are based on successful regional experience and are aimed at addressing common frustrations. They are flexible, tested and dependable guidelines for planning, constructing and maintaining a *Naturescapes* project. The resource document contains the following sections:

- 1.0 Introduction**
- 2.0 Planning and Implementing Naturescapes Projects**
- 3.0 Project Ideas**
- 4.0 Project Resources**

1.2 What are *Naturescapes* Projects?

Naturescapes describes a wide and diverse range of projects and activities relating to the natural environment. This includes projects directed toward: planting native and/or ornamental plants, providing habitat for a diversity of animal and plant species, and educational activities contributing to building and sustaining a healthier environment and contributing to the quality of life.

1.3 What are the Benefits of *Naturescapes* Projects?

Naturescapes have the potential to provide many benefits by:

- Enriching the diversity and beauty of the urban environment.
- Requiring less input of energy and resources (water, fertilizers and fuel, etc.) than high maintenance landscapes (traditional lawns), once they are established.
- Promoting an understanding of natural cycles to help people make choices that contribute to the health of the environment.
- Reducing dust, vehicle exhaust and other air-borne pollutants through the filtration capabilities of trees and shrubs.
- Providing meaningful ways to educate about the natural environment.
- Fostering an environmental awareness in a direct hands-on way.
- Building a sense of community spirit through pursuing and achieving common goals.

Naturescapes are dynamic. They are alive with constant change that invites school and community groups to learn about the natural environment. Creating and maintaining *Naturescapes* requires a commitment that engenders a sense of responsibility and empowerment, resulting in an increased sense of pride in, and ownership of, community and school property. *Naturescapes* provide tangible ways of improving the urban environment in the Edmonton Region.

2.0 PLANNING AND IMPLEMENTING NATURESCAPES PROJECTS

There are a variety of ways for *Naturescapes* projects to get started. Projects may arise from issues relating to a particular space, a classroom wanting a butterfly garden or a community group wanting to establish a community garden. This section is intended to assist the user in understanding the fundamental requirements for initiating and implementing a *Naturescapes* project in the Edmonton region.

2.1 Getting Started

Determining Who Owns the Land

Before a project can get underway, you will need to determine who owns the land for which the project is slated. In most cases, stewardship for this land will fall under the jurisdiction of one of the Joint Use partners – the City of Edmonton, Edmonton Catholic Schools or Edmonton Public Schools. Each of these partners in turn will have policies and programs to guide and support the project. For example, the City of Edmonton has a program called “Neighbourhood Parks Develop Program” (NPDP) which provides criteria and detailed steps for undertaking an improvement on community parkland. Some funding is also available through this program.

Approvals to Proceed

Once the site partners have been determined it is important to apprise them of your intentions and to gain the necessary preliminary approvals to proceed. City and the School Board staff will provide direction with respect to key related policies and appropriate planning practices. In addition, City staff can provide advice on *Naturescapes* projects slated for alternate sites such as utility corridors, transportation right of ways or commercial properties. (Contact numbers are listed in Section 4.1 under “Institutions and Agencies”)

Forming a Committee

Regardless of the size and scope of the *Naturescapes* project, it is recommended that a committee be formed to help steer the project from a concept to reality. A committee will help to ensure that a variety of perspectives are taken into consideration during all project phases as well as spread out the workloads. Ideally, the committee should include those with an immediate vested interest in the project along with experts such as a naturalist, landscape architect and planner.

Developing a Planning Process

Having established a committee, the next step is to develop a plan of action. This plan should spell out details for all aspects of the project including:

- setting project goals and objectives
- initiating community discussion and input
- project design
- fundraising
- construction
- follow-up maintenance and reclamation plans
- programming

City and School Board staff can provide ideas and direction for each of these action plan elements.

Considerations for Community Discussion

For the *community discussion* and *input* phase, there are a variety of processes that can be used. They can be as simple as a survey or open house, to more elaborate processes such as “envisioning” or “walkabouts.” Additionally, since *Naturescapes* projects are a relatively recent phenomena, it is important to include an educational component for all those involved. Again, City and School Board staff can provide a wealth of information and direction for this aspect.

Children, a Special Stakeholder

As adults we are encouraged to involve children in the planning process, however, too often children's input is not taken seriously. For example, we ask children what they would like to see in a park or playground but rarely provide them with education on the possibilities. Similarly, they are rarely apprised of, or take part in follow-up planning exercises.

Fortunately, there are a growing number of examples of children's participation in planning processes. In one school project, the Parent Advisory Committee took on the role of ‘project facilitators’, with the children becoming the central planners. In this case, planners, engineers, landscape architects and naturalists all became part of the student's support system for the design of an outdoor classroom.

Taking time to find ways of meaningfully involving children, not only in the design phase but in the implementation and maintenance aspects of the project, will greatly enhance the project benefits for all concerned.

2.2 Planning Details - Site Inventory and Layout Considerations

The following guidelines will provide planning details to consider when entering into the initial design phases of a *Naturescapes* project. Recommendations on specific kinds of *Naturescapes* projects can be found in the next section.

Site Suitability

The suitability of a site will depend on a variety of factors including past land use, existing site features, topography, vegetation and microclimates - all in relation to the type of project being proposed. Not every site can support each type of *Naturescapes* project. Therefore, it is important to learn about what is suitable on your site before deciding on the type and scale of *Naturescapes* project you would like to establish.

- Examine the context of the proposed site. For example, consider the impact adjacent land uses could have on the project and vice versa. Is there a possibility this land may be developed in the near future?

- Anticipate community support for the project, especially from adjacent residents. Consider how possible negative reactions could be avoided through education and information prior to the actual implementation.
- Consider how the edges of the project will be defined? That is, how will the physical and visual transition be made from the *Naturescapes* project to the adjoining sites?

Site Inventory

A comprehensive site inventory is necessary to understand all the elements that will influence the design and character of the project. The end product of a site inventory is a site plan of existing conditions showing the location of features such as:

- fences
- existing vegetation (including weed infestation and condition and width of tree/shrub canopy)
- paved areas, sidewalks
- turf areas (mown grass)
- overhead and underground utilities
- buildings (note where doors and windows are located)
- lighting
- existing footpaths or preferred routes of travel (sometimes called desire lines)
- existing drainage patterns (poorly drained areas, high/low points)
- seasonal use of the site (snow clearing, ski trails, track and field)

It is also important to investigate the history of the proposed site. Is there a possibility that past land uses (industrial, agricultural, etc.) have affected the quality of the site through soil compaction, waste disposal, and pesticide or fertilizer use, potentially influencing the outcome of your project? Was the site previously a topsoil stockpile? What is the depth of topsoil on the site?

Examining all the factors that could influence the success of your project before you start will give you greater decision making confidence once you begin to develop a detailed design.

Layout and Design Considerations

Specific site planning guidelines for each *Naturescapes* project type are given in Section 3.0. General design considerations common to all project types are highlighted here.

Opportunities and Constraints

Water Source

- It is essential that a source of clean, accessible water is located near your project. Utilize an existing irrigation system, or locate a water source within a reasonable distance, allowing for standard lengths of hose. A fillable water tank may serve if no other source is available.

Shelter (sun and wind)

- A fence, building or hedge, especially on the north and west sides of the project, provide beneficial shelter from predominating winter winds. Not only are damaging, drying winds reduced, but the area will also be warmer, due to reflected heat.

Coniferous trees provide an excellent wind barrier and also help to trap snow, providing better moisture conditions in the spring.

Consider designating areas for shade that can be created by deciduous trees or shade structures.

Accessibility

- You must consider accessibility to your project for everyone in your community. Although this may not be achievable at all sites, every attempt should be made to provide for the needs of the physically challenged, the elderly and small children through all seasons. *Naturescapes* should be hospitable places not only for plants, birds, insects and animals, but also for the children and adults who will come to see and experience the project.

There are many resources available on how to make your project accessible. City and School Board Staff can make these available (see Section 4.4 for contact listing).

Site Visibility

- From a safety and vandalism perspective, it is desirable that a majority of your proposed site be visible from the street, surrounding neighbours and adjacent school and community buildings.

Poorly Drained Areas

- Poorly drained areas may be desirable if you are planning a wetland habitat on your site. Regardless of whether the poorly drained area is seen as an opportunity or constraint, ensure that it drains away from adjacent buildings, play areas, seating areas or other amenities.

Location of Sports Fields, Ice Rinks, etc.

- Generally, sports fields are considered to be site constraints. Your project should be located a reasonable distance away so that potential for interference between the two is minimized and safety zones around the fields are maintained.

Slopes

- Ideally, if you have a sloping site, it should fall to the south to utilize the sun's warmth and light. North facing slopes tend to be shadier and moister, limiting the type of plants that will grow. Slopes are sometimes ideal areas for seating and gathering.

Overhead and Underground Utilities

- Ensure that the proposed site elements meet or exceed required setback guidelines from all utilities, including: telephone, gas, power, water and storm sewer. Take into account the mature size of the trees and other vegetation.

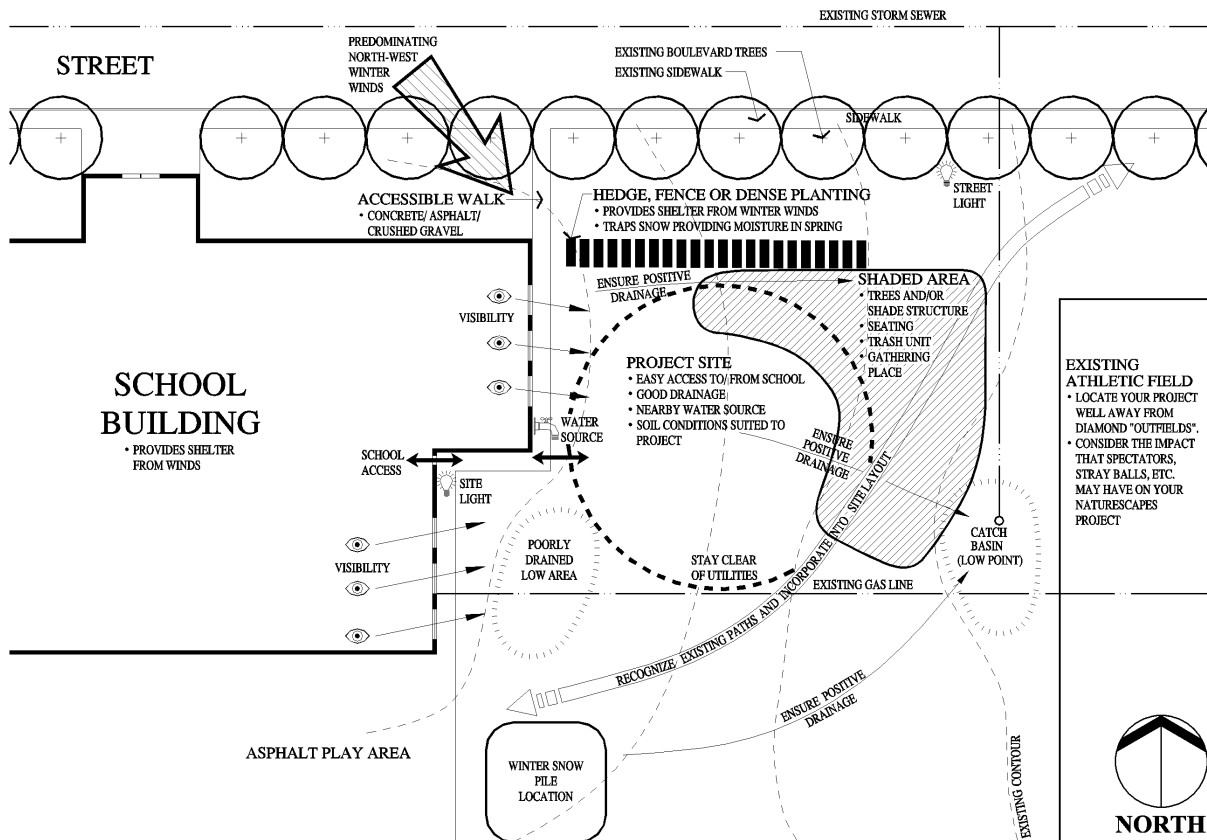
In addition to obtaining guidance from one of the Joint Use partners, consider retaining a consultant to assist in developing a site plan and preliminary cost estimate for the project. Experts can be included in the process by drawing concept plans of the proposed project and listing the reasons for their design decisions. Through group discussion of all the proposals, a consensus can be reached regarding the proposed design for your project.

Sample Site Plan

The sample site plan below illustrates some of the common site inventory, layout and planning concepts to be considered for a *Naturescapes* project. Every plan will be different, as they are site specific and dependent on the type of project that is suitable for the site. It does not illustrate project specific detail that is developed following approval of your project idea. Your plan should illustrate the information necessary to prepare a preliminary cost estimate for the project.

The plan shows:

- a site protected from predominating north-west winds by the school building and a proposed hedge, fence or dense planting
- the project oriented to the south with a majority of the site receiving full sun for most of the day
- a nearby water source located at the school building
- the proposed project area located away from existing overhead and underground utilities
- a well drained site with an even slope illustrated by the contour lines
- accessible pathways on one side of the proposed project site
- good visibility from the school interior to the project site
- a proposed partly shaded area, a gathering place, seating and trash unit



3.0 PROJECT IDEAS

3.1 Diversity of Ideas and Approaches

This section is intended to provide the user with a selection of ideas for *Naturescapes* projects in the Edmonton region. Ideas are categorized under the following headings:

- Outdoor Classrooms
- Gardens
- Native/Regional Landscapes
- Stewardship Projects

The project types are outlined and described separately, however, various combinations of the ideas and approaches may be tried, provided that they meet project goals and objectives and a suitable site is available. It should be noted that all the projects, to varying degrees, provide habitat for a variety of birds, butterflies, insects and animals.

In addition to the ideas outlined, it is recommended that you take time to explore and learn about the many built *Naturescapes* projects in the Edmonton region. See Section 4.1 for a listing of projects.

3.2 Outdoor Classrooms

Outdoor Classrooms provide places for school and community groups to learn about, observe and to take part in activities related to, the natural environment. Outdoor Classrooms vary in size and design from a place as simple as the shaded space under a poplar tree, to a permanent structure with furnishings.

Depending on the size of the structure and the materials used, the long-term cost and implications of maintaining your Outdoor Classroom will vary.

Project Ideas

- Shade Trees -shade trees provide shelter while making it possible to maintain a very direct connection with nature
- Bermed Areas -landforms can be shaped to provide areas that permit groups of people to focus on an activity or presentation, e.g. an amphitheatre
- Seating Area -a hard surface such as crushed gravel, brick pavers or asphalt with picnic tables and benches
- Permanent Structure -the possibilities are numerous, such as a gazebo, trellis, platform deck, etc...

Site Suitability, Planning and Preparation Guidelines

Ideally, an Outdoor Classroom on a school or park site should be located close to the school or community building. It should be visually and physically accessible in all seasons it is to be used. Consider the broad range of people who will benefit from access to the Outdoor Classroom, from toddlers to the elderly.

Be sure to determine whether your Outdoor Classroom requires a building and development permit.

Design and Implementation Guidelines

Providing shade for a group of people is the most important function of an Outdoor Classroom, no matter what its size or how it is constructed.

Outdoor Classrooms should include seating or areas that can comfortably accommodate groups of people who will gather to listen, study, observe and share ideas. If a seating area is included, consider the orientation of those seated with respect to the sun. It is best if seating is oriented toward the north.

Whatever materials you choose to construct your Outdoor Classroom, keep it simple. Bear in mind that the construction could potentially be cost effectively completed by a group of volunteers.

Visibility from within the Outdoor Classroom to the surrounding environment is important, not only for security and safety, but also so that plantings or other site features associated with the Outdoor Classroom can be appreciated.

Consider the year round use of your proposed Outdoor Classroom. As an example, a structure could be built that has removable panels, doubling as a warm-up shelter for ice skating and tobogganing in winter and an open-air structure in spring and summer.

The space within an Outdoor Classroom needs to be flexible. The ability to modify elements such as seating and tables should be a priority.

The Outdoor Classroom cannot be designed in isolation of the proposed site. The integration of the Outdoor Classroom (whether it is a permanent or temporary structure) with associated existing or proposed plantings, pathways or other amenities should be considered from the start of the project.

3.3 Gardens

Ornamental Gardens

The style, form and philosophy of ornamental gardens can be approached in the following ways:

- formal (geometric, often symmetrical)
- informal (curvilinear, more random)
- various combinations of the above

There are many types of plants to choose from including:

- native (wildflowers) annuals, biennials and perennials
- non-native (exotic or introduced) annuals, biennials and perennials
- native and non-native shrubs and trees (woody plants)

Ornamental gardens must:

- be comprised of well prepared, fertile soil with a minimum depth of 30cm
- have a nearby water source

Depending on the garden and choice of plants, consideration should also be given to protection from the wind.

There needs to be a consensus as to the type of garden your group wants to implement as well as an understanding of the maintenance requirements. An ornamental garden should reflect the aesthetic goals, environmental values and maintenance capabilities of the people who have created it.

Regular weeding, watering and removal of dead and dying plant parts are key to maintaining the health and beauty of a flower garden.

Ornamental plantings can include:

- Classic Perennial Border -a perennial planting bed with a variety of plant sizes, colour combinations and foliage types, blooming from spring to fall
- Native Flowers of Alberta -flowers from many regions of the province
- Edible Flowers and Plants -flowers like Nasturtiums and Daylilies can make colourful additions to salads
- Spring Bulbs -bulbs like Daffodils, Tulips and Squills (Bluebells) create blooms early in the season
- Wild Roses -Alberta's provincial flower

- Shade Plantings -flowers like Primrose thrive in shady spots
- “Symbols and Shapes” -low-growing annuals, in a multitude of colours and textures are used to create patterns, words, shapes and symbols
- “Giant” Flowers -create a magical environment of gigantic flowering plants like Sunflowers, Delphiniums, Castor Beans and Hollyhocks combined with tall flowering vines like Sweet Peas and Scarlet Runner Beans

Site Suitability, Planning and Preparation Guidelines

Consider how your proposed plantings will fit into its surroundings. For example, a formal style flower garden may be most suitable in a school courtyard, given the strong architectural definition of the space; whereas, an open site including a remnant aspen bluff lends itself to a more naturalistic “wildflower” garden. Note layout and structure opportunities for the garden like existing plants and fences.

Most of the site should receive at least six hours of sunshine per day. A few shady areas are desirable, as some flowers need full or partial shade to survive. A larger selection of flowers can be grown if there are a variety of areas within the garden: shady/cool vs. sunny/hot; sloping (well drained) vs. flat; and sandy, coarse soil vs. highly organic, peaty (acidic) soil.

Design and Implementation Guidelines

Look around the city, taking notes and pictures of gardens you like, then try to emulate them.

The shape and size of the flower garden depends on the amount of space available and the look that is desired.

Many shapes and forms are possible including:

- a raised planter at the entrance to a public building
- a linear planting along a sidewalk
- an “island” planting surrounded by turf or a hard surface area
- a traditional perennial or annual border along the south side of a fence or building

To make an impact, a planting should generally have a minimum width of 1.5m at any given section.

Make a plan by drawing your proposed garden to scale on paper, reflecting the size and shape chosen.

- subdivide the plantings into desired colour and height zones
 - taller plants at the “back,” or at the “centre” for an island planting

- consider the blossom times and distribute flowers evenly throughout the garden for maximum blooming
- allot areas for each plant - by considering the mature size, it is possible to calculate how many plants are required

A long garden hose can help to visualize and layout a curvilinear planting area. If your garden is surrounded by mown turf, remember a mower should be able to easily negotiate the curves.

Terra cotta or plastic pots and wooden planters on casters are well suited for growing annuals. They can be moved to various locations as required or be used to define a space for an outdoor classroom. Generally, container-grown plants require daily watering and should be located in secure areas.

Consider the colour and form of the flowers and foliage.

- Colours can be combined subtly, with similar colours together (red, red-violet, violet) or boldly, using strong contrasting colours (blue with orange)
- Some colours reflect more light than others in general terms
 - white and yellow, the most reflective, are more effective in shadier areas than darker colours
 - blue and red are the least reflective and should be considered for sunny areas
 - annuals tend to have purer hues than perennial plants and wild/native flowers, so care should be taken when grouping annuals to reduce the possibility of a “colour clash”
- Foliage has varying growth habit, visual texture and colour that provide structure and interest whether plants are in bloom or not

Plants grown from “bulbs” (including tuberous roots, corms, tubers and rhizomes) like Tulips, Daffodils and Hyacinth are well suited to the school year. They are planted in the fall just after students begin classes, and are some of the first plants to come up in the spring, before the school year is over. The anticipation that builds over the winter is rewarded with a beautiful display of colour in the spring.

Maintenance Tips

The removal of dead and dying flowers (deadheading) during the growing season may encourage continuous bloom. Ongoing removal of dead flowers, foliage and weeds helps to control disease and keeps the garden looking more aesthetically pleasing.

Remove all plants or plant material after the heavy frosts of fall as this material can provide places for harmful insects and pathogens to over-winter.

Especially in perennial and wild flower gardens, the removal of weeds (unwanted species) should be an ongoing activity. Preventing an infestation of weeds is considerably easier than removal once well established.

Vegetable/Herb Gardens

Seeds, tubers, bulbs and transplanted seedlings are planted in vegetable and herb gardens for the purposes of growing food or simply for the joy of watching plants grow. Because of the long sunny summer days and generally fertile soil of the Edmonton area, high quality vegetables and herbs can thrive during our short growing season.

Community gardens are allotment type gardens initiated by community groups for growing food and flowers, sometimes composting kitchen and yard waste. They are usually located on vacant lots or underutilized land such as utility or road rights-of-way.

Much of the material presented here is condensed from Gardening on the Prairies – A Guide to Canadian Home Gardening by Roger Vick.

Vegetable/Herb Gardens must:

- be located in places that are sunny for at least half, and preferably three-quarters of the day
- be comprised of well-prepared, fertile soil with a minimum depth of 40cm
- have a nearby water source

Ideas that may be incorporated in a garden project

- Intensive Food Production -provide maximum yield from limited space, narrow paths between rows
- Neighbourhood Gathering Place -comfortable seating, sandbox, wide paths, special needs
- Children's Garden -smaller plots, diverse crops, available for school or daycare use
- Horticultural Therapy -barrier free, raised beds for easy access, available for seniors and hospitals
- Humanitarian Use of Produce -donate all or a portion of produce to foodbank, shelters or local residents
- Indoor Connections -dried flowers for arrangements, wreathes and other crafts

Site Suitability, Planning and Preparation Guidelines

Although trees can help to provide protection for the garden, avoid areas with lots of trees, as they will not only shade your garden too much, but will compete with your vegetables and herbs for nutrients and moisture.

On your site plan, note shady areas and propose to grow shade tolerant vegetables there such as beets, broccoli, lettuce, peas, spinach and parsnips.

Locate tall plants like sunflowers and corn on the north side of the garden so they do not shade other plants. Give sun-loving tomatoes lots of room. If space is limited, sprawling vine-like plants like squash and cucumbers can be trained onto supports.

Avoid planting the same or similar plants in the identical location each year as a way of controlling insects and disease. Learn about “companion planting,” the practice of minimizing competition between plantings for moisture and nutrients, by sowing deeper-rooted vegetables like beets and carrots next to shallow-rooted vegetables like lettuce and spinach or nitrogen fixing legumes such as peas and beans.

Design and Implementation Guidelines

Start planning what you would like to grow during the fall and throughout the winter, by perusing the many seed catalogues that are available. Remember that early maturing cultivars are best for our short growing season.

Purchase your seeds, tubers, sets or seedlings and follow closely the directions on the package or those from a local nursery or horticulturist. Plant your garden as soon as possible in the spring, about a month before the last frost—usually late April--and preferably on a calm day.

For traditional row planting, use string pulled taut to guide the straight layout of your rows. Label the planting using a waterproof pen on wooden stakes. Record the location of each species on a plan in case the stakes are removed. Rows spaced at 0.5 m apart should suffice for smaller vegetables like carrots and beets; larger vegetable rows will require spacing of about 1m Spreading plants such as squash, cucumbers and pumpkin will need at least 1.5–2 m between rows or hills. Generally, rows of about 6–9 m in length will provide enough of any one vegetable for the average family. Realize that one small packet of seed can produce plenty of vegetables which will for the most part, ripen all at once.

Not all vegetables can be planted at the same time and some are best planted as seedlings or “transplants,” giving them a head start in our climate:

- Scarlet runner beans, cabbage and cauliflower should be seeded in the latter part of May.
- Other tender vegetables that do not tolerate frost, like eggplant, peppers, tomatoes, cucumbers, squash, watermelon and pumpkin are most suited to planting as transplants, when all danger of frost is over (early June).
- Onions are best grown from bulbs.
- Use certified seed pieces or “eyes” for potatoes and avoid the temptation to use ordinary market potatoes which are more likely to harbor disease.

Alternatives to the traditional row planting in a vegetable and herb garden include “broad band seeding” and raised planters. Seeding in broad bands creates shade between plants,

conserving moisture and helping to suppress weed growth. Raised wooden planters with a soil depth of about 40cm have several advantages:

- the aerated root run is twice the normal depth,
- the soil warms faster in the spring, augmenting the growing season,
- the “crop” is generally of a higher quality and quantity,
- the height of the planter enables elderly or physically challenged people greater accessibility to the joy of gardening and
- planter gardening may be better suited to the spaces available at school and other public or community sites.

Maintenance Tips

As the vegetables and herbs start to grow, follow seed package directions for thinning the young plants. This should not be done all at once, but rather at intervals to prevent the creation of gaps. Note that plants from later thinnings may be of an edible size.

After thinning, to keep the soil moisture even and discourage weed growth, apply a 3-5cm depth mulch of one of the following:

- compost
- grass clippings
- dead leaves
- peat moss

Photocopy your garden plan and make notes regarding the successes or failures of the different areas of your garden for future reference.

Harvesting your crop at the right time is important. Large produce may be interesting, but it will not necessarily taste better!

Tree/Shrub Nursery

If plants are required in a few years or there is a desire to grow one's own, a tree/shrub nursery is an option. In a tree/shrub nursery, woody plants are grown with the intention of moving them to another location when they reach a specified size.

Choose a lightly shaded location, shielded from the wind, with a nearby water source. Hot, windy or "full sun" locations will be too stressful for young seedlings.

Ideas for Plant Production

- Native Trees/Shrubs
 - trees and shrubs grown from seeds collected from native trees, for use in creating Native/Regional Landscapes, or Stewardship projects

- Urban Forest Trees/Shrubs (Note that plants from seed will vary from the parent plants)
 - collect seed from street trees within the city
 - obtain permission first
 - some seeds mature in spring, such as American Elm, Silver Maple and Poplar; others mature in the fall, like Amur Maple, Manitoba Maple, Bur Oak, Green Ash and Birch
 - collect Pine and Spruce cones in paper bags so that the fine seeds are contained when the cones open

- Trees to Attract Birds
 - trees and shrubs that will provide food for birds such as Choke Cherries, Saskatoons, Mountain Ash, and Crabapple

- Trees/Shrubs for Autumn Colours
 - trees and shrubs with impressive fall colours such as Black Ash (clear bright yellow), Amur Maple (bright red), Pincherry (orange-yellow), and Mountain Ash (deep orange-rusty red)

- Trees/Shrubs for Spring Blossom
 - early spring blossoming trees and shrubs such as 'Northern Gold' Forsythia (yellow), Double Flowering Plum (pink) and Rosybloom Crabapples (many colours)

Site Suitability, Planning and Preparation Guidelines

If the location criteria in Section 2.2 can be met, then the site planning is mostly complete. An area already lightly shaded by mature trees is perfect. It is surprising to realize how little space is actually required for a tree nursery, at least while the trees are 1 – 3 years old. A space that is 1m x 3m can accommodate 20–30 young trees up to 1m in height, or several hundred tree seedlings for 1–2 years.

Design and Implementation Guidelines

Raised wooden planters are a recommended method for a school site. Planting in this way physically defines the project, reducing the possibility of damage from mowing, vandalism or trampling. There is also the added advantage that the planting soil will not be compacted by foot traffic or maintenance vehicles. If the planters are no wider than 1 m the plants can easily be tended.

If the nursery is planted in a field, old garden plot or similar site, take care to define it with a fence and signage telling others about the project.

The growing medium should be a light soil mix composed of soil from the site combined with compost or peat moss, and bone meal to promote root development. As an alternative, use a commercially available garden soil mix. Optimum soil depth is 30cm.

Both seed and seedling transplants may be used to get your nursery growing. Transplants are available from local nurseries, forestry projects, or from tree planting initiatives by service groups. These are sometimes free of charge so check into the possibilities.

If the planting is relatively small in scale, such as the raised planter option, the seeds may be scattered on the surface of well-watered planting soil. Germination should not be a problem if the soil is kept moist.

Prevent squirrels from eating nuts or seeds in your planting by covering raised planters with chicken wire, stapling it to the sides.

If the planting is at a larger scale, with the intention of moving the trees when they are older than 5 years, care should be taken to plant the seed or seedlings in straight rows, allowing for:

- a minimum of 20cm between each tree and 50cm between rows for the first two years
- 1m between each tree and 1m between rows for the following 3 – 4 years

Label the planting using a waterproof pen on wooden stakes. Record the location of each species on a plan in case the stakes are removed.

Maintenance Tips

Ensure that there is enough space to grow healthy young trees. Just like a vegetable garden, the seedlings will have to be thinned.

Mulch of approximately 10cm depth is required to suppress weeds and conserve moisture. Deciduous wood or bark chips and bark peelings are recommended.

Transplanting

Once the trees are of a size suitable for transplanting, care must be taken not to damage roots when digging and most importantly to dig a "root ball" sufficiently big for the size of the tree. A minimum size of 30cm is required for trees and shrubs with a trunk diameter up to 2.5cm, measured 30cm above ground. Allow another 30cm of root ball diameter for every additional 2.5cm diameter of trunk measured 30cm above ground. Keep the root ball well watered. Have the tree planting holes dug at the new site before digging the trees to be moved, so that the time the plants spend out of the ground is minimal. Ensure the tree is planted at the same level in the soil at the new planting area as the level it was originally growing.

An area that is visible from a window or nearby seating area, away from direct human disturbance and other distractions is an excellent place to develop bird habitat. Consider the project as an “outdoor room” for birds, where trees and shrubs forms the walls that provide refuge from winds, rain and predators.

A school courtyard makes an ideal location for bird habitat. The minimum size of such a space should be about 100 sq. m.

Design and Implementation Guidelines

Include a variety of plant species, preferably those with seeds and fruit that persist throughout the winter.

To attract the greatest diversity of species, mimic the spatial structure of the forest by including three distinct layers of vegetation.

- herbs, including grasses and wildflowers
- shrubs
- trees

Next to providing shelter and food, a water source is the best way to ensure that your bird garden will be successful. Birdbaths are commercially available or you can be inventive and make one yourself. See the Project Ideas above.

Your birdbath should:

- be flat-bottomed
- have a non-slip surface with a gradual incline
- be no deeper than 6cm.
- be placed in a shady spot
- be kept clean, with water being replenished daily

Various sized rocks and pebbles can be added to the bath to create different depths of water. Moving water, even a slow drip, will attract more birds than calm water. Create motion with pumps/fountains or go the simple route and hang a bucket of water with a small hole punched in the bottom.

If cats are in the neighbourhood, elevate the birdbath and locate it at least 5m away from shrubs. If you locate it on the ground, encircle it with wire mesh. Inverted cones of wire mesh or metal at the base of feeders and birdbaths help to create a safer haven for birds from cats and predatory birds.

A “mud hole,” possibly created by allowing your birdbath to overflow, provides Phoebes, Thrushes and Swallows with the mud required to build their nests in late spring and early summer.

Bird feeder location and type, as well as the seed mix composition influence the kinds of birds that you can attract. If you have room for only one feeder, the best success will be

achieved by providing mixed seed on a platform feeder with raised edges so that seed doesn't blow away.

All white flour products such as bread, baking or pastry should not be used as feed, as they are low in nutrition and expand in the stomach when they become wet, potentially harming the bird. Ensure that all seeds provided are unsalted. Beef fat or suet prepared and hung in an onion bag or within fine wire mesh, is particularly popular with Woodpeckers, Chickadees and Nuthatches. Realize that some seeds, especially larger seeds like peanuts and sunflower seeds, will attract squirrels.

Crushed eggshells within the vicinity of your feeders will provide a valuable calcium supplement for female birds prior to laying their eggs.

Locate hummingbird feeders near windows or decks. Hummingbird nectar is made with 1 part sugar to 4 parts water. Once the hummingbirds have discovered the nectar, reduce the concentration of the sugar solution to 1:6. Take caution, however, as too high a concentration of sugar can result in liver damage. Do not use honey in the feeders, as it ferments and rapidly cultures mold that can kill the birds. Hummingbirds are attracted to red, so ensure that a part of the feeder structure is red. Do not colour the nectar with red food colouring, as this may cause the birds serious harm.

You may notice other birds with a sweet tooth such as Grosbeaks, Tanagers, House Sparrows and Finches feeding at the hummingbird feeder. You can better accommodate these larger birds with a conventional hamster or gerbil water bottle available at pet shops.

In Edmonton, cavity nesting birds like House Wren, Black-Capped Chickadee, Tree Swallow, House Sparrow, European Starling and Purple Martins are the likely occupants of nesting boxes. The basic design is the same for all species, but the location you choose, the size of the box and the entrance hole will determine which species are most likely to make a home in your garden. Ensure the box is level or tilted somewhat when installed to keep the inside dry. Supply nesting material such as string, yarn and feathers throughout your garden. Visit your local library or contact a birding organization for ideas to make the perfect birdhouse. There is lots of information available.

Create a healthy environment. Avoid using granular fertilizers, lawn and garden herbicides and pesticides that may be eaten by birds.

Maintenance Tips

Replenish and clean the water sources regularly.

Clean out nesting boxes annually.

Provide an adequate supply of nesting materials.

Check the feeders and nesting boxes for damage after storms or prolonged inclement weather.

Clean up seed that blows or spills from feeders.

Butterflies prefer plants with fragrant, tubular, clustered flowers such as Lilac and Honeysuckle as well as flat-topped flowers. Goldenrod, Aster and Yarrow are three native plants that are attractive to butterflies. Your garden can include both native and non-native plants, but be sure that any non-natives you include are not invasive or weedy. To increase the appeal of your garden to butterflies, include plants that blossom at different times throughout the growing season.

The caterpillars (larvae) of each butterfly species have very specific plants on which they feed, different from those on which the adult butterfly will feed. Most often the plants on which larvae feed are indigenous. It is important to research the butterflies you want to attract and to know what plants the larvae and butterflies prefer or require. For example, more than ten species of butterflies lay their eggs on Poplar trees.

Place plants of the same species together for greater impact when in bloom, making it easier for the butterflies to see.

Never use pesticides within or near your butterfly habitat.

Maintenance Tips

Ensure your feeding stations are properly maintained. Sugar water should be changed often. Keep puddling areas consistently wet.

Leaf litter and other plant debris should be left to provide shelter for the many butterflies that pupate, over-winter or lay eggs in dead plant material.

3.4 Native/Regional Landscapes

Grassland Habitat

For simplicity in this resource document, the term grassland will be used to describe the landscape and plants also commonly referred to as prairie and prairie parkland.

Typical grassland is composed not only of grasses, but also flowering plants and small groupings of shrubs and trees. Groves of Trembling Aspen and Balsam Poplar occur within the Northern Fescue Grassland surrounding Edmonton, forming part of what is known as the Aspen Parkland, an ecoregion that extends southeast to southern Manitoba.

It is not possible to find examples of undisturbed grassland in the Edmonton region. Due to agricultural development, the arid grasslands of Western Canada have been subjected to the greatest destruction of biodiversity known in Canada this century. Less than 5% of the original Fescue Grassland/Aspen Parkland remains.

A *Naturescapes* Grassland project seeks to establish grassland plants that are native to the Edmonton region on a suitable site.

A well drained, sunny site is essential for a successful *Naturescapes* Grassland project.

The site must be as weed-free as possible before planting begins. Most of the effort in creating a Grassland project should be directed toward site preparation. If there are existing turf grasses or weed species on the proposed site, they must be eliminated. The more weeds that can be eradicated before planting, the more successful your Grassland project will be. If it takes more than one growing season to get rid of weeds on the proposed site, it will be time well spent.

Obtaining native seed, seedlings or sod originating from the Edmonton region is very important. Seed from the local area will have a longer life and will increase the viability and ecological integrity of the project over the long term.

Much of the material presented here is condensed from Restoring Canada's Native Prairies, by John Morgan.

Project Ideas

- Grassland Greenhouse
 - grow grassland plants in your classroom or community centre for use in a grassland project
 - obtain seed from local suppliers or collect your own

- Sodding a Grassland -sometimes native grassland is threatened by development projects such as roadways or new subdivisions; the grassland can be removed using techniques used in the sod growing industry and replanted on your site
- Sowing a Grassland -grassland may be seeded “from scratch” like a crop
-obtain seed from local suppliers or collect your own

Site Suitability, Planning and Preparation Guidelines

The site suitability, planning and preparation guidelines, as well as the design and implementation guidelines that follow pertain most directly to the “Sowing a Grassland” project idea listed above.

Keep your project modest. The size of the project will dictate the equipment required, as well as the time involved and the amount of seed required. A size of 50 – 200 sq. m. is recommended. Doing a good job on a small area is more satisfying than tackling a larger area and being overwhelmed by the increased maintenance and costs.

Grassland species do not require rich soil. Adding fertilizer to a Grassland project will only encourage weed growth. Never add landscaping topsoil, as it is very high in nitrogen and usually full of weed seeds. Either of these will doom your project.

Acquiring Seed or Seedlings

Do not use “wildflower” mixes that originate from the United States or Europe. They look beautiful for a season but contain mostly annuals and non-native seed. Refer to the plant lists in Section 4.3 and other sources listed in Section 4.5 to determine if plants included in the seed mixes are native to the Edmonton region. Do not use any of the so-called native grass mixes that include invasive, non-native species such as Crested Wheatgrass (*Agropyron cristatum*) and Smooth Brome grass (*Bromus inermis*). These grasses have their place in agricultural and domestic landscapes, but are not suitable for a Grassland project.

Your group could collect seed from locations within the Edmonton region with the guidance of a knowledgeable botanist, ecologist, biologist or naturalist. Be sure to obtain the necessary permission or permits to enter private or leased land, avoiding sensitive or protected areas. Do not collect seed from the same area in consecutive years. Always leave at least half the seed behind.

Include as many species native to the region as possible. Generally, seed mixes containing a 75% to 25% ratio of grasses to wildflowers are appropriate. Seeding rates are still in the experimental stage, but broadcast seeding rates of 33 kg/ha (30 lbs./acre) should suffice.

The existing vegetation and soil conditions will determine site preparation:

Bare Topsoil

- Bare topsoil resulting from a previous garden, agricultural production or other use, usually has some perennial weeds that must be eliminated. Hand pulling and turning of the soil will likely suffice. Be sure to dig roots out completely. Rid the area of any lumps by raking and hoeing, and then pack the soil with a lawn roller pulled by hand.

Exposed Subsoil or Fill

- Exposed subsoil or fill resulting from construction or other disturbance can provide excellent weed-free growing conditions. If the site is heavy clay, drainage and soil conditions can be improved by scarifying the soil and incorporating sand and peat.

Existing Vegetation

- Existing vegetation is the most common condition. Allow at least one full season for the elimination of existing vegetation and weeds. Black polyethylene may be spread out over the site and left in place for a full growing season, eliminating weeds by heating the soil to a point where plant growth and weed seeds are killed. Or, if the site is extremely weedy, mow the area and remove the cuttings from the site. After mowing, let weeds grow to a height of about 20 cm. and have a qualified, licensed person apply herbicides. If this approach is taken, ensure public signage is in place that identifies the extent of the spraying program. Cultivation or rototilling to a depth of 10 cm. follows the herbicide treatments. Smooth any lumps with rakes and hoes.

Design and Implementation Guidelines

Layout

Avoid creating a rectilinear plot or “island” that looks like an experimental test site. Try to blend the project into the existing contours and context. A linear planting beside an existing built feature such as the south side of a fence or along a walk may help the project look less isolated and more like it had always been there.

Designing the actual plant locations within the Grassland is not complex, seed the area and let nature take its course. Some plants prefer moist areas; others will do better in dry, sloping areas, but the seeds will sort this out on their own.

Locations near a bench or window can be planted with a greater amount of showy, flowering species.

Grassland sites can be fire hazards. Allow a minimum 30 m. buffer strip between your Grassland and any adjacent buildings

If you are using seedlings from a nursery or plan to grow your own, ensure that the seed used is from a local source, preferably from within 50 km of Edmonton.

Planting/Seeding

Seeding of the site can begin once you have made the greatest effort possible to eliminate perennial weeds, given available time and resources. Spring seeding in early May is most desirable. Do not seed after September 1.

If at all possible, seed before a rain. Seed may be broadcast by hand or with push-type fertilizer applicators.

After broadcast seeding, it is essential to pack the soil surface with either a lawn roller or by trampling with many enthusiastic feet. The crust created by this packing procedure reduces evaporation and increases seed-to-soil contact, improving germination.

If the project is larger in scale and equipment such as a Truax seed drill is being used for seeding, then packing of the soil is done mechanically, after seeding. Following seeding and packing, the area should be mulched with weed-free straw or sawdust to a depth of approximately 2 cm. Mulching reduces erosion and keeps the soil moist, also enhancing germination.

Maintenance Tips

Be patient. Grassland plants establish an extensive root system before showing much growth on the surface. This substantial root system is what enables grassland plants to survive in an arid climate and to endure periods of drought.

Adequate watering and weed control are the most important aspects of the maintenance and management of your Grassland project. Over time, as the plants become established, the need for weeding will decrease.

Mowing is a useful weeding technique, especially during the first few seasons of growth, as the weeds will be higher than the grassland plants. Spot treatments of herbicide applied with a backpack or wick applicator may be necessary for select treatment of tough perennial weeds like Canada Thistle. Applications should be carried out by a qualified, licensed person. Of course, hand pulling is always an option, but be sure to wear heavy gloves and remove as much of the root system as possible. Regular weeding, with many hands, will prevent the situation from getting out of control.

Every 5 – 10 years, the site should be mowed, the cuttings burned and the ashes spread over the site to eradicate weeds and increase the vigor of the native plants. This process simulates the conditions of a grassland fire. Be sure to check municipal fire regulations when undertaking this procedure.

Weeding requires the ability to distinguish weeds from desirable grassland plants. Refer to Restoring Canada's Native Prairies, by John Morgan for photographs of some juvenile grassland species. Learn to identify weeds common to the Edmonton region.

Where seeds fail to germinate, re-seeding of the area may be necessary. Pack the area firmly with a roller or by foot to establish good seed to soil contact.

Post interpretive signage to educate the community about the project's process and goals. Identify on your signage, the people and groups who have contributed to the effort. Emphasize the length of time it takes for grassland plants to establish. Communicate the need to restore grassland habitat to preserve native species and gain a better understanding of the landscape that preceded European settlement of the Canadian prairies.

Wetland Habitat

Plants such as cattails and bulrushes and birds like the Red-winged Blackbird, ducks and geese characterize wetlands in the Edmonton region. Wetlands are some of the most ecologically diverse natural areas on Earth. In Canada, over 155 species of birds and 50 species of mammals are permanent or temporary residents of wetlands. They are the preferred or required habitat for one-third of endangered, threatened or vulnerable wildlife in Canada.

The observation and study of the web of interdependent relationships between organisms in a wetland is one of the most accessible and vivid ways to begin to understand ecosystems.

In this resource document, Wetland is used to describe projects of varying size that seek to provide the appropriate growing conditions for aquatic plants, insects and wildlife. It is recommended that your Wetland project include mostly, if not exclusively, native wetland plants, animals and fish. The outdoor environments that support exotic plant and animal species such as tropical water lilies and goldfish tend to increase maintenance and do not provide the diversity of habitat desirable for native plants and animals.

The proposed Wetland site must receive at least 5 hours of uninterrupted sunlight per day. Your project will be a lifeless place unless photosynthesis, which is dependent on sunlight, can take place. This enables algae and other oxygen producing plants to survive, providing the basis for the existence of all other life forms within the Wetland.

Much of the material presented here is condensed from Environmental School Program: A Teacher's Guide - Second Revised Edition by Godo Stoyke.

Project Ideas

- Using an Existing Depression
 - possibly, the area could be excavated to increase its size
 - try to minimize damage to existing desirable vegetation during construction
- Oak Barrel Pond (or other non-metallic container)
 - the area required for this type of Wetland project need not be large
 - use a ready-made non-metallic container
 - provide aeration with a small pump
- Trenches, Swales, Temporary Streams
 - existing natural or man-made drainage systems can be maintained as Wetland projects
- Willow Cuttings
 - spring cuttings inserted into moist soil will grow rapidly, stabilizing the banks of your Wetland and creating conditions favourable for the establishment of other plants

Site Suitability, Planning and Preparation Guidelines

Significant accumulations of leaf litter from existing trees or other vegetation may cause problems for your Wetland. Bacteria require oxygen to break down the leaf litter. However, oxygen is in short supply in the fall and winter, causing decomposition to slow down or stop. This allows leaf litter to accumulate, preventing light penetration to the lower levels of the Wetland, creating maintenance problems and promoting algae growth.

Determine if the proposed site is located within a fertilized turf area or near fertilized areas that drain into your project, which could increase nutrients beyond acceptable levels. If pesticides or herbicides are used on areas adjacent to, or draining into your project, reconsider the location of the project, or work toward the discontinuation of pesticide and herbicide use near the site.

Realize that the shallower your project, the warmer the water will be. Shallow water encourages the growth of algae and creates a less ecologically stable environment. Also, the evaporation rate on a shallow Wetland will be greater.

Design and Implementation Guidelines

Geometric shapes such as circles and squares are recommended if you are seeking a formal look to your Wetland. If you desire something more natural looking, consider a curvilinear, asymmetrical shape.

In addition to marginal plants, floating and submerged plants should be included in the project. For those requiring soil, it is best to use potted plants, as they are easy to remove for maintenance and over-wintering of non-hardy species. They also provide "instant" green, and can be rearranged if you are not satisfied with the look of your Wetland. The preferred rooting medium is sand, as it will not muddy the water. Floating plants such as water lilies should cover about one-half to two-thirds of the water surface area. Alternatively, if you have patience and are prepared to let nature take its course, wetland species will establish in the area after only a few years, providing opportunity for the study of plant colonization and succession.

Native woody and herbaceous plants should be included in your Wetland project, not only to stabilize the water's edge and provide habitat for the birds, animals and insects that you want to attract, but also to ensure the project has a more natural look. Old tree trunks, logs and rock piles will increase habitat diversity too.

Your Wetland project will potentially contain a significant number of invertebrate creatures, from microscopic waterfleas to macroinvertebrates such as the common freshwater shrimp and water boatmen. Such creatures will fly in or hatch without any effort on your part. The transplanting of aquatic vegetation into your Wetland project will introduce another crop of living organisms. Snails can be added to help control algae growth.

Although in most school and public park sites it is difficult to provide conditions necessary for fish to flourish, native Brook Stickleback and Ninespine Stickleback are the most likely

to survive in man-made wetlands. Unless your Wetland project is much deeper than the recommended depths, the fish will have to be taken out for the winter, as the water will freeze to the bottom. If you choose to include exotic fish species such as Goldfish or Koi, remember they will reduce the animal diversity significantly in the project. Never add pet shop animals such as turtles, as they are not suited to the environment and may also transmit diseases harmful to the other life forms in the your Wetland project.

Constructing a Self-Contained Wetland

The following guidelines are most suitable to projects where a Wetland is being created “from scratch.” If you are utilizing an established low area or wetland for your project, many of the suggestions given here may be irrelevant, as aquatic plant, insect and animal life will likely already be established.

A minimum water surface area of 5 sq. m. allows enough space for an environment to evolve that can begin to approximate a natural ecological balance. Allow for an overland overflow drainage route to maintain the recommended maximum depth of 45cm in the pond, and direct excess water away from structures, playing fields, etc.

Next, consider the excavated profile of your Wetland project. To provide for marginal (water's edge) plants, a ledge of varying height, approximately 20 cm in width should be incorporated into the excavation profile around at least half of the Wetland. To increase the habitat provided for plants and animals within the Wetland, vary the excavation profile so that beyond the ledge the bottom slopes gently toward the deepest point in some areas, and more steeply in others. The gentle slope encourages vegetation to develop and provides access for amphibians, reptiles and mammals. Steeper sections provide hiding areas.

Roughly mark the outline of your Wetland project with stakes, and then scrape a line in the soil surface between the stakes with the tip of a spade to form the shape of the Wetland. Then start digging.

After excavation, ensure that there are no sharp objects protruding from the soil that could puncture the liner. When excavating, remember to allow for 5 - 10cm of sand, sifted soil or a layer of carpet to cushion the liner and prevent punctures.

The liner you choose will be based on expectations for the longevity of the project and the funds available. Heavy-duty plastic sheeting (polyethylene) is not recommended, as it degrades quickly in sunlight. A popular and durable material for lining is PVC (polyvinylchloride) laminated with a UV resistant layer. The highest quality liner is a butyl synthetic rubber sheet, with an estimated lifetime of 50 – 100 years. Butyl lining costs about twice as much as PVC lining. Liners can be purchased at a local garden centre.

PVC and butyl liners are stretched flat across the cavity, secured by weights. When water is added, they stretch to conform to the excavation cavity. Flat,

smooth stones can be used at the water's edge to cover the liner. Stabilize the stones with sand.

Tap water can be used to fill your Wetland, but allow the water to stand for at least a week or preferably longer, to permit chlorine to escape before adding any living thing.

Maintenance Tips

Your Wetland may be quite murky when first constructed. Disturbance caused by the construction will take a while to settle, but in time all the elements will begin to balance and function together as a biological community. In the long term, water with a greenish or brown tinge is to be expected in your Wetland project. The water will never be crystal clear.

Depending on the size, location and species within your Wetland, maintenance such as weeding and the removal of plant and animal matter will vary. Accumulations of biological matter will have to be monitored to ensure that they do not create nutrient levels that lead to anaerobic conditions. Occasionally, some waste "muck" will have to be removed from the bottom of the Wetland.

Leaf litter and other decaying plant matter around the Wetland will provide habitat for insects that in turn provide food for birds and other animals. The aesthetic expectations of those involved and the desirability to attract certain insects and animals within the project will determine the amount of acceptable accumulations of this material.

Become familiar with invasive plant species such as Purple Loosestrife and remove them immediately.

If you have included plant and animal species that are not winter-hardy, research the specific requirements for maintaining them indoors over the winter.

Woodland Habitat

A *Naturescapes* Woodland project seeks to establish a landscape that is similar in composition and visual impact to the native woodland of the Edmonton region. Trembling Aspen dominates the native woodland in the drier upland areas of the Edmonton region. Balsam Poplar and White Spruce dominate in cooler, moister areas such as north facing slopes along the North Saskatchewan River and within ravines leading into the river valley.

The following guidelines outline an active approach, i.e. planting, rather than a passive approach to woodland establishment. In a passive approach maintenance practices are altered, usually mowing is stopped, to promote the establishment of colonizing species and subsequent succession species that evolve into mature woodland over time.

It is recommended that only species native to the Edmonton region should be used in your Woodland project.

Unless you are involved in a project where the timing is right and resources have been mobilized to relocate and transplant mature, existing native vegetation, your Woodland project will take time to establish and mature over a period of a several years.

Project Ideas

- Natural Succession
 - this approach is modeled on the way woodland establishes in nature, with fast-growing “pioneer” or “nurse” species planted first, followed by plantings of the slower-growing climax species
 - Trembling Aspen and Balsam Poplar, along with several shrub species, would be planted first
 - when the Aspen and Poplar are established, the slower growing White Spruce are planted

- Plantation
 - with this approach, Aspen, Poplar and White Spruce would be planted all at once, but without any accompanying shrub species
 - shrubs (the understory) are planted after the trees are established

- Transplanting
 - in this approach, mature species are moved, for example, from a nursery or a site threatened by development, to a site where the new planting is similar to the groupings and distribution of plant growth observed in nature

Site Suitability, Planning and Preparation Guidelines

Your Woodland project will be more successful if moisture conditions are favorable. If you are faced with a windswept, dry, open area, a Grassland project may be better suited to your site. Aerial photos or other documentation may help determine the pre-development vegetation community of your proposed site. If woodland existed on the site prior to development, your project is more likely to succeed.

Before you dive into your Woodland project, take the time to explore and become familiar with the three major woodland types in the Edmonton area:

- Aspen Forest
- Balsam Poplar Forest
- White Spruce Forest

White Spruce Forest is considered the “climax” woodland type in our region. Mature Aspen and Poplar provide the shade and conditions that make it possible for White Spruce to establish.

Decide which forest type is most suited to your proposed site. Observe where and how each species grows, i.e. singly or in clusters. Record your observations and take photos for reference. Keep observations of the patterns of growth in mind when deciding where, and in what configuration, to plant each species.

Unless you are prepared to water your Woodland project regularly, choose a site where there is good drainage, but also adequate moisture. Areas between hills, where water slows down as it drains, or along, but not in a swale (drainage channel/route) are ideal for a Woodland project.

Design and Implementation Guidelines

Geometric forms and straight lines do not belong in a Woodland project. Plantings should be staggered and spaced unevenly. Most species should be clustered together, not planted singly. The closer together the plantings, the higher the survival rate tends to be, as the plants provide protection for each other. In addition, closer planting reduces maintenance over the long term because the plants will fill in gaps more quickly, choking out the space and sunlight required by weeds.

If you are planting within or augmenting existing woodland, pay careful attention to the shape formed by the edge of the existing forest. Use this shape as a guideline when planning your proposed planting. Imagine looking down on your Woodland project and consider how its shape on the land fits with the existing forest around it. Most Woodland projects will appear to be more natural if they are made up of large plantings, rather than small, dotted “islands” of planting.

The best time to plant is in the spring, when plants are dormant, generally prior to May 15. The next best time is in the fall. If you have access to container grown plants, they may be planted at any time during the season.

Native woodland species may be purchased from a local nursery, started from cuttings or, with the proper observance of private property and bylaws, collected from the wild.

If there are existing turf grasses or weed species on the proposed site, they must be eliminated. If possible, pull the weeds by hand. If the site is particularly weedy, follow directions for site preparation and weed control discussed in Grassland Habitat (Section 3.4). The more weeds that can be eradicated before planting, the more successful your Woodland project will be. If it takes more than one growing season to get rid of weeds on the proposed site, it will be time well spent.

Mulch of approximately 10cm depth is required to suppress weeds and conserve moisture. Deciduous wood or bark chips and bark peelings are recommended.

Maintenance Tips

Your Woodland project will require only occasional weeding and watering if adequately mulched.

Learn about the prevention and treatment of diseases and insects that could possibly harm your Woodland such as Black Knot (Pincherry) and Spruce Budworm (Spruce trees).

3.3 Stewardship Projects

A *Naturescapes* project does not always “start from scratch.” There are opportunities for making Edmonton a greener, more ecologically healthy city through conserving, rehabilitating or enhancing existing sites.

Conservation involves identifying an existing natural feature and protecting it so that it remains unaffected by interventions and is able to mature and evolve naturally. Where a site has been disturbed to the extent that there has been an impact on its sustainability, rehabilitation may be required. There are also existing sites, both natural and man-made, where contributions can be made to enhance the environment for all living things. On-site interpretation and education (usually in the form of signage) is central to the long-term success of these three types of initiatives.

Some of the information provided under Sections 3.3 Gardens and 3.4 Native/Regional Landscapes may assist you with the Stewardship projects listed in this section. In many cases, elements of all three initiatives--conservation, rehabilitation and enhancement--will be part of a *Naturescapes* Stewardship project, as they are seldom separate, unrelated ventures.

Local experts such as Joint Use partner representatives, naturalists, ecologists, landscape architects, biologists and horticulturists can provide guidance and technical help with your Stewardship project. Section 4.0 includes many valuable sources of information. Don't limit your search to only one source. In many cases there is more than one way to achieve your goals and there may be differences of opinion. The more input you receive the better the chance of success with your project!

Partners in Parks

This Edmonton Community Services initiative invites local interest groups to establish a partnership with the City in conserving, rehabilitating, enhancing or maintaining existing open space in the Edmonton region. Suitable sites can be as small as a landscaped road island or as significant as a ravine or river valley woodland area.

Project Ideas

- Interpretive Signage
 - explaining rare, unusual, and significant plant and animal life in an area
 - describing the conservation, rehabilitation, enhancement or maintenance initiatives

- Food for Wildlife
 - plant native or hardy fruit-producing shrubs in an existing planting bed that requires rejuvenation

- Dutch Elm Disease (DED) Programs
 - organize a DED information session and an elm bark beetle and DED monitoring program in the neighbourhood

- Pruning Workshops
 - invite a qualified pruning specialist, certified by the International Society of Arboriculture to make a presentation to the neighbourhood
 - this information is particularly important for those who want to prevent DED on their elm trees
- Clean-up Projects
 - organize a clean-up of a local ravine or creek bed by a community team
- Weeding Projects
 - mobilize community groups to weed open areas of invasive species such as Scentless Chamomile, Canada Thistle, Common Burdock and Purple Loosestrife
 - educate about the harmful effects of these plants on agricultural and natural areas
 - investigate native vegetation reclamation strategies for the site
- Adopt an Area
 - adopt a boulevard, traffic island, pocket park or other well-defined open space in need of restoration, enhancement or maintenance
- Protection Projects
 - erect a temporary fence or other barrier, in combination with signage, to allow for colonization and regrowth of native vegetation in a disturbed area
- Bird and Bat House Projects
 - build or maintain bird or bat houses to increase habitat within the community
- No-Mow Areas
 - identify areas on public land where cessation of mowing could help to decrease maintenance costs and encourage wildlife habitat without compromising neighbourhood aesthetic values and expectations

Woodlands Adjacent to School and Park Sites

Many open space sites in the Edmonton region include remnant pockets of woodland. Often the change in drainage patterns and groundwater conditions caused by development adjacent to these woodlands alters the condition and aesthetics of the vegetation. An assessment of these sites often results in the understanding that succession within the woodland has been stimulated and a change in the plant species composition is to be expected.

Project Idea

- Woodland Conservation
 - conservation could entail laying down wood chips on some of the established trails within the grove
 - barriers may be required to restrict access and enable the forest to recover from disturbance
 - signage could be posted explaining that only foot traffic on the wood chip/bark trails is allowed within the woodland
 - interpretive signage could be developed that informs about the vital role of Trembling Aspen and Balsam Poplar woodland to our ecological zone

Wetlands Adjacent to School and Park Sites

As in other urban areas, development in the Edmonton region has eliminated most of the natural wetlands. Despite being one of the most biodiverse and fascinating landscapes, the wetlands that remain are often mistreated and have sometimes been used as waste disposal or landfill areas.

Most existing wetlands in the region are on the fringes of the city and some are adjacent to school and park sites. These wetlands represent Stewardship project opportunities for school and community groups.

Project Idea

- Reclamation of a Small Wetland
 - site clean-up to remove refuse and dumped material
 - site access restrictions may be necessary to allow vegetation to regenerate
 - re-establish the perimeter band of native vegetation
 - signage could be developed to educate about the importance of biodiversity within wetlands, fostering respect for this often negatively perceived landscape
 - remember to utilize the Edmonton ECO Station for the disposal of hazardous material such as paint cans

Composting

Composting is the process of accelerating the decomposition of organic waste from the building site and yard. The end product is compost, a humus-like soil amendment, which improves soil texture thereby increasing the soil's capacity to retain water and nutrients, resulting in increased fertility.

Approximately 50% of the waste destined for landfills is organic and could potentially be composted.

Compost can be used throughout the landscape, wherever plants are being grown - trees, shrubs, lawns, flower and vegetable gardens all benefit. The incorporation of compost into soil improves plant growth, flower and root development and suppresses disease.

In order to produce compost, it is essential to balance the following:

- "brown" organic material, high in carbon, which include such things as sawdust, straw, dry grass, fallen leaves
- "green" organic material, high in nitrogen, which include such as organic kitchen waste, fresh weeds or other green plant material
- aeration
- proper moisture levels

Project Ideas

- Weight Comparisons -compare the weight of the organic material that goes into the composter and compare it to the weight of the compost produced
- Vermicomposting -indoor composting with Red Wiggler worms to decompose kitchen/lunchroom waste using containers such as utility tubs, galvanized metal tubs or wooden boxes
-for more information see Worms Eat My Garbage by Mary Appelhof, listed in Section 4.5

Site Suitability, Planning and Preparation Guidelines

A compost pile or container should be:

- sheltered from drying winds
- positioned in a sunny, but not hot area
- in a well drained location
- convenient and accessible, without being obtrusive

Heat from the sun increases the microbial activity that contributes to the breakdown of the organic matter. The shadier the location, the slower the composting process will be.

Design and Implementation Guidelines

Composting can be done in an open pile or within a container. A compost container can take many forms, both homemade and commercial. The most important feature of the container is that it provides for air circulation within and around the compost.

Several types of frames may be built to accommodate compost. A wood frame with wire mesh sides and open top is the most common type. One side of the frame should be removable or open like a door to facilitate turning of the pile.

A minimum size of 1 cubic metre for an outdoor composter is required to provide the necessary organic mass for producing compost.

Starting and maintaining your compost requires that a few steps be followed very carefully:

1. Loosen the soil in the chosen location (not necessary if you are container composting).
2. Put down a layer of coarse, not fleshy, plant material such as sunflower stalks to provide aeration at the base of the pile.
3. Add alternating layers of:
 - “browns” – 15-20cm of carbon material, such as dry grass trimmings, fallen leaves, straw, etc.
 - “greens” – 7.5-10cm of nitrogen material, such as weeds, green plant material, etc.
 - soil – 1.25cm to inoculate the compost pile with microorganisms necessary for decomposition. The soil also reduces the leaching (loss) of mineral nutrients and traps escaping nitrogen gas.
 - water – do not soak
4. Continue to repeat these layers, building the compost pile to at least 90cm.
5. Cap the pile with 5-7.5cm of soil to trap gases and retain nutrients.

Monitor the compost pile to ensure the breakdown of the organic material is progressing properly. If all is in order, the compost will produce temperatures up to 66 °C! The heat kills weed seeds and pathogens (living organisms that cause disease) and accelerates decomposition.

Dried, crushed eggshells, vacuum cleaner bag contents, tea bags, coffee filters and grounds can be composted. Do not add any animal products including dairy products, fats or pet waste to the compost.

No additives are necessary, as all the required elements are in your yard, kitchen and lunchroom waste.

Maintenance Tips

If the compost is damp and sweet smelling, but not heating up, add nitrogen rich material. There should be no foul odours emanating from the compost. A bad odour indicates that the compost is either becoming anaerobic (lacking oxygen) or is too wet. To add oxygen, turn

and loosen the pile with a pitchfork or shovel. To dry out the compost, spread it out in the sun for a while.

The contents of the compost pile must be turned at least twice a month, breaking up the clumps. It must be mixed, old material with new and dry with wet. The compost should be kept damp, not sopping, never too wet nor too dry. If it's too dry, add water and turn the compost. If it's too wet, spread the compost out in the sun, let it dry and return it to the composter.

The time it takes to produce humus may take anywhere from one to six months, depending on several factors:

- ambient temperature and humidity
- moisture content
- material particle size
- aeration

When ready, the compost is very dark, crumbly and “earthy” smelling. Any larger pieces of material that have not completely decomposed should be sifted out and returned to the composter.

Unwanted visits by rodents and other animals can be prevented by immediately covering any food scraps with soil and keeping the area adjacent to the composter clean.

The breakdown of organic material slows down during cool fall weather, stopping completely during mid-winter, but in the spring, following a thorough turning of the contents of the compost pile, the process will again begin.

4.0 PROJECT RESOURCES

4.1 Naturescapes Projects in the Edmonton Region

Outdoor Classrooms and Outdoor Natural Areas

- Ecole Frère Antoine School Site 2850 – Millwoods Road
- Greenview School Site 5904 – 38 Avenue
- Mount Pleasant School Site 10541 – 60A Avenue
- Lago Lindo School Site 17303 – 95 Street
- Good Shepherd School site 18111 – 57 Avenue
- Belgravia School 11605 – 74 Avenue
- Coronation School 10925 – 139 Street

Community Gardens

- Boyle Street Community Gardens 103 A Avenue east of Firehall
- Garneau Community League and School Site 10925 – 87 Avenue
- Mennonite Centre for Newcomers (Grant McEwan College) Contact 424-7709
- Richfield Community Garden (Millwoods)
- Covenant Christian Reformed Church 8810 Meadowlark Road
- Wecan Cooperative Fort Road near Alberta Hospital
- Jewish Cemetery 7622 – 101 Avenue

Woodland Habitat

- Holy Family Elementary and Junior High School 1710 Millwoods Road East

Wetlands Adjacent to School and Park Sites

- Greenview School 5904 – 38 Avenue
- Belgravia School 11605 – 74 Avenue
- Popular Lake in Klarvatten Neighbourhood

Woodland and Ravines Adjacent to School and Park Sites

- Crawford Plains School 4210 – 12 Avenue
- Minchau School 3615 Millwoods Road East
- Julia Kiniski School 4304 - 41 Avenue
- Falconer Heights Neighbourhood Park

School Site Enhancement Projects

- Grovenor School 10345 – 144 Street
- Lago Lindo School 17303 – 95 Street
- Tipaskan School 1200 Lakewood Road N
- Kiniski Gardens School and Park Site

4.2 Native Plant Lists

About the Plant Lists

The following lists will assist you in determining native plants most suited to each *Naturescapes* project type for the Edmonton region. Plants most suitable for each project type are indicated by a black dot • or other symbols defined below. The list is to be a guide only. Other plants not listed may be suitable. There are many excellent resources for non-native plants. Some of these are referenced in Section 4.4.

Inclusion in the list does not mean that plants/seeds are commercially available. The actual number of native species available for purchase is very limited. Contact the Alberta Native Plant Council and the Landscape Alberta Nursery Trade Association (LANTA) for information on native plant/seed availability.

- Only those trees and shrubs on approved plant lists for school and park sites in Edmonton that are considered extremely hardy and are easily transplanted have been indicated as desirable for tree/shrub nursery projects.
- You will encounter many references to “native” or “indigenous” plants when researching your *Naturescapes* project. If a source says a plant is “native,” you may have to investigate more thoroughly to find out if the plant is native to the Edmonton region specifically, or whether the term is being used to suggest it is native to Alberta, Western Canada or North America, etc.
- For the purpose of this resource document, “native” plants have been defined to include only those found in the Dry Mixedwood and Central Parkland natural sub-regions surrounding Edmonton, as defined by Alberta Environmental Protection. Only the most common plants native to these regions have been listed. For more information on these natural regions, see [A Guide to Using Native Plants on Disturbed Lands](#) referenced in Section 4.4.
- Under the Woodland Habitat heading, plants suited to an Aspen Woodland project are indicated by “A”; plants more suited to a Mixed Woodland (deciduous-coniferous woodland typical of the ravines in the Edmonton area) are indicated by “M”. Plants suited to both woodland types are indicated by a dot •.

<p>NATIVE GRASSES and GRASS-LIKE PLANTS H-attracts hummingbirds N-nectar source L-larval food source A-aspen woodland M-mixed woodland</p>	<p>NATURESCAPES PROJECT TYPE</p>						
<p>PLANT SPECIES</p>	<p>Flower Gardens</p>	<p>Tree/Shrub Nursery</p>	<p>Bird Habitat</p>	<p>Butterfly Habitat</p>	<p>Grassland Habitat</p>	<p>Wetland Habitat</p>	<p>Woodland Habitat</p>
Alakali Cord Grass <i>Spartina gracilis</i>					•		
Awned/Slender Wheatgrass <i>Agropyron trachycaulum</i> var. <i>unilaterale</i>					•	•	•
Baltic Rush <i>Juncus balticus</i>				•		•	
Blue Grama Grass <i>Bouteloua gracilis</i>				•	•		
Bluejoint <i>Calamagrostis canadensis</i>				•		•	•
Canada Wild Rye <i>Elymus canadensis</i>					•		
Canby Bluegrass <i>Poa canbyi</i>				•	•		
Common Cattail <i>Typha latifolia</i>						•	
Common Great Bulrush <i>Scirpus validus</i>						•	
Creeping Spike Rush <i>Eleocharis palustris</i>						•	
Early Bluegrass <i>Poa cusickii</i>				•	•		
Fowl Bluegrass <i>Poa palustris</i>				•		•	•
Fringed Brome <i>Bromus ciliatus</i>				•	•		•
Great Bulrush <i>Scirpus acutus</i>						•	
Green Needle Grass <i>Stipa viridula</i>				•	•		•
Hairy Wild Rye <i>Elymus innovatus</i>							M
Hooker's Oat Grass <i>Helictotrichon hookeri</i>					•		
Indian Rice Grass <i>Oryzopsis hymenoides</i>					•		
June Grass <i>Koeleria cristata</i>				•	•		•
Little Club-moss <i>Selaginella densa</i>					•		
Mountain Rice Grass <i>Orzyopsis asperifolia</i>							M
Narrow-Leaved Reed Grass <i>Calamagrostis stricta</i>				•		•	M
Needle and Thread Grass <i>Stipa comata</i>				•	•		
Nodding Brome <i>Bromus anomalus</i>				•	•	•	•
Northern Reedgrass <i>Calamagrostis inexpansa</i>				•		•	
Northern Wheatgrass <i>Agropyron dasystachyum</i>					•		•
Plains Bluegrass <i>Poa arida</i>				•	•		
Plains Reed Grass <i>Calamagrostis montanensis</i>				•	•		•
Plains Rough Fescue <i>Festuca hallii</i>				•	•		A

<p>NATIVE GRASSES and GRASS-LIKE PLANTS H-attracts hummingbirds N-nectar source L-larval food source A-aspen woodland M-mixed woodland</p>	<p>NATURESCAPES PROJECT TYPE</p>						
<p>PLANT SPECIES</p>	<p>Flower Gardens</p>	<p>Tree/Shrub Nursery</p>	<p>Bird Habitat</p>	<p>Butterfly Habitat</p>	<p>Grassland Habitat</p>	<p>Wetland Habitat</p>	<p>Woodland Habitat</p>
Purple Oat Grass <i>Schizachne purpurescens</i>							M
Rocky Mountain Fescue <i>Festuca saximontana</i>				•	•		•
Sandberg Bluegrass <i>Poa sandbergii</i>				•	•		
Sand Dropseed <i>Sporobolus cryptandrus</i>					•		•
Sand Grass <i>Calamovilfa longifolia</i>					•		
Sedges <i>Carex</i> spp.				•	•	•	•
Sheep's Fescue <i>Festuca ovina</i> var. <i>saximontana</i>				•	•		•
Slough Grass <i>Beckmannia syzigachne</i>						•	
Small-Fruited Bulrush <i>Scirpus microcarpus</i>						•	
Spangle Top <i>Scolochloa festucacea</i>						•	
Sweet Grass <i>Hierochloe odorata</i>					•		•
Tall Manna Grass <i>Glyceria grandis</i>						•	
Timber Oat Grass <i>Danthonia intermedia</i>					•		•
Three-Square Rush <i>Scirpus pungens</i>						•	
Water Foxtail <i>Alopecurus aequalis</i>						•	
Western Porcupine Grass <i>Stipa curtiseta</i>				•	•		
Western Wheatgrass <i>Agropyron smithii</i>					•		
Woodland Bluegrass <i>Poa interior</i>				•	•		A

NATIVE FLOWERS and FORBS H-attracts hummingbirds N-nectar source L-larval food source A-aspen woodland M-mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Alum-Root <i>Heuchera richardsonii</i>				•	•		•
American Sweet Vetch <i>Hedysarum alpinum</i>				N			•
American Vetch <i>Vicia americana</i>				N			•
Ascending Purple Milk-Vetch <i>Astragalus striatus</i>				L	•		M
Baneberry <i>Actaea rubra</i>							M
Bastard Toadflax <i>Comandra umbellata</i>					•		
Bee Plant, Spiderflower, Pink Cleome <i>Cleome serrulata</i>					•		
Bergamot, Horse Mint <i>Monarda fistulosa</i>			H	•	•		A
Blue-Eyed Grass <i>Sisyrinchium montanum</i>					•	•	•
Blue Lettuce <i>Lactuca pulchella</i>				N	•		•
Bunchberry <i>Cornus canadensis</i>				•			M
Canada Anemone <i>Anemone canadensis</i>					•		•
Canada Goldenrod <i>Solidago canadensis</i>			•	N	•		•
Club Moss <i>Selginella densa</i>					•		
Common Pink Wintergreen <i>Pyrola asarifolia</i>							A
Cow Parsnip <i>Heracleum lanatum</i>				L			M
Cow Wheat <i>Melampyrum lineare</i>							M
Cream-Coloured Pea Vine <i>Lathyrus ochroleucus</i>				N			•
Creeping White Prairie Aster, White Prairie Aster <i>Aster falcatus</i>			•	N	•		
Cursed Crowfoot <i>Ranunculus sceleratus</i>						•	
Cut-Leaved Anemone <i>Anemone multifida</i>							•
Drummond's Milk Vetch <i>Astragalus drummondii</i>				L	•		
Early Blue Violet <i>Viola adunca</i>				•			A
Early Yellow Locoweed <i>Oxytropis sericea</i>				N	•		
Fairy Bells <i>Disporum trachycarpum</i>							M
Fireweed <i>Epilobium angustifolium</i>			H	•	•		•
Gaillardia, Blanket Flower <i>Gaillardia aristata</i>				N	•		
Golden-Bean <i>Thermopsis rhombifolia</i>				N	•		
Golden Dock <i>Rumex maritimus</i>				•		•	
Graceful Cinquefoil <i>Potentilla gracilis</i>				N	•		•
Ground Plum, Buffalo Bean <i>Astragalus crassicaarpus</i>				L	•		

NATIVE FLOWERS and FORBS H-attracts hummingbirds N-nectar source L-larval food source A-aspen woodland M-mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Gumweed <i>Grindelia squarrosa</i>				N	•		
Hairy Golden Aster <i>Heterotheca villosa</i>			•	•	•		M
Harebell <i>Campanula rotundifolia</i>					•		•
Horseweed, Canada Fleabane <i>Erigeron canadensis</i>				N	•		
Late Yellow Locoweed <i>Oxytropis monticola campestris</i>				N	•		•
Lily-of-the-Valley <i>Maianthemum canadense</i>							M
Lindley's Aster <i>Aster ciliolatus</i>			•	N			•
Locoweed <i>Oxytropis monticola</i>				N	•		
Long Fruited Anemone <i>Anemone cylindrica</i>					•		•
Low Goldenrod <i>Solidago missouriensis</i>			•	N	•		
Macoun's Buttercup <i>Ranunculus macounii</i>						•	•
Many-Flowered Aster, Tufted White Prairie Aster <i>Aster ercoides</i>			•	N	•		
Marsh Cinquefoil <i>Potentilla palustris</i>				N		•	
Marsh Hedge-Nettle <i>Stachys palustris</i>						•	
Marsh Marigold <i>Caltha palustris</i>						•	
Marsh Skullcap <i>Scutellaria galericulata</i>						•	
Mealy Primrose <i>Primula incana</i>						•	
Mountain Goldenrod <i>Solidago spathulata</i>			•	N			M
Narrow-Leaved Dock <i>Rumex triangulivavlis</i>				•		•	
Narrow-Leaved Hawkweed <i>Hieracium umbellatum</i>				N			A
Northern Bedstraw <i>Galium boreale</i>							A
Northern Sweet Vetch <i>Hedysarum boreale</i>				N	•		A
Northern Willowherb <i>Epilobium ciliatum</i>				•		•	
Northern Wormwood <i>Artemisia campestris</i>				•	•		•
Pasture Sage <i>Artemisia frigida</i>				N	•		
Philadelphia Fleabane <i>Erigeron philadelphicus</i>				N		•	•
Prairie Cinquefoil <i>Potentilla pensylvanica</i>				N	•		
Prairie Crocus <i>Anemone patens</i>					•		•
Prairie Sage <i>Artemisia ludoviciana</i>				N			
Purple Milk Vetch <i>Astragalus dasyglottis</i>				L			•

NATIVE FLOWERS and FORBS H -attracts hummingbirds N -nectar source L -larval food source A -aspen woodland M -mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Purple Pea Vine <i>Lathyrus venosus</i>				N	•		•
Purple Prairie Clover <i>Petalostemon purpureum</i>				N	•		
Purple Rock Cress <i>Arabis divaricarpa</i>				•	•		
Pussytoes, Low Everlasting <i>Atennaria aprica</i>				N	•		
Rush Aster <i>Aster borealis</i>			•	N		•	
Saline Shooting Star <i>Dodecatheon pulchellum</i>						•	
Scarlet Mallow <i>Malvastrum coccineum</i>				N	•		
Seaside Crowfoot, Buttercup <i>Ranunculus cymbalaria</i>						•	
Showy Aster <i>Aster conspicuus</i>			•	N			M
Silver-Leaf Psoralea <i>Psoralea argophylla</i>				N	•		
Silverweed <i>Potentilla anserina</i>				N		•	
Slender Arrow-Grass <i>Triglochin palustris</i>						•	
Slender Milk-Vetch <i>Astragalus flexuosus</i>				L	•		
Small-Leaved Everlasting <i>Atennaria parvifolia</i>				N	•		
Smooth Aster <i>Aster laevis</i>			•	N	•		A
Smooth Fleabane <i>Erigeron glabellus</i>				N	•		M
Spreading Dogbane <i>Apocynum androsaemifolium</i>				N			M
Stiff Goldenrod <i>Solidago rigida</i>			•	N	•		•
Veiny Meadow Rue, Western Meadow Rue <i>Thalictrum venulosum</i>				•	•		•
Western Canada Violet <i>Viola canadensis</i>				•			A
Western Willow Aster <i>Aster hesperius</i>			•	N		•	
Western Wood Lily <i>Lilium philadelphicum</i>			H	•			M
White Evening Primrose <i>Oenothera nutallii</i>			H		•		
White Cinquefoil <i>Potentilla arguta</i>				N		•	
Wild Blue Flax, Lewisii Wild Flax <i>Linum lewisii</i>					•		•
Wild Licorice <i>Glycyrrhiza lepidota</i>				L	•	•	A
Wild Mint <i>Mentha arvensis</i>				•		•	
Wild Peavine, Purple Pea Vine <i>Lathyrus venosus</i>				N	•		
Wild Sarsaparilla <i>Aralia nudicaulis</i>							M
Wild Strawberry <i>Fragaria virginiana</i> var. <i>glauca</i>			•	•			M

NATIVE FLOWERS and FORBS H -attracts hummingbirds N -nectar source L -larval food source A -aspen woodland M -mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Wild White Geranium <i>Geranium richardsonii</i>				•			M
Woolly Cinquefoil <i>Potentilla hippiana</i>				•	•		
Tall Lungwort <i>Mertensia paniculata</i>				•			M
Twin-Flower <i>Linnaea borealis</i>							M
Yellow Evening Primrose <i>Oenothera biennis</i>			H		•		M
Yellow Water Crowfoot <i>Ranunculus gmelinii</i>						•	
Yarrow <i>Achillea millefolium</i>				N	•		A

NATIVE SHRUBS H-attracts hummingbirds N-nectar source L-larval food source A-aspen woodland M-mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Coniferous							
Creeping Juniper <i>Juniperus horizontalis</i>					•		
Ground Juniper <i>Juniperus communis</i>							•
Deciduous							
Balsam Willow <i>Salix pyrifolia</i>				•		•	•
Beaked Hazelnut <i>Corylus cornuta</i>							•
Beaked Willow <i>Salix bebbiana</i>		•		•		•	
Bearberry, Kinnikinnik <i>Arctostaphylos uva-ursi</i>				•			•
Bog Birch <i>Betula glandulosa</i>			•	•		•	
Bracted Honeysuckle <i>Lonicera involucrata</i>			•	•			•
Canada Buffaloberry, Russet Buffaloberry <i>Shepherdia canadensis</i>							•
Chokecherry <i>Prunus virginiana</i> var. <i>melanocarpa</i>	•	•	•	•	•		•
Common Blueberry <i>Vaccinium myrtilloides</i>				•			M
Coyote Willow <i>Salix exigua</i>				•		•	
Green Alder <i>Alnus crispa</i>				•			M
High-Bush Cranberry <i>Viburnum opulus</i>	•	•	•	•			M
Low-Bush Cranberry <i>Viburnum edule</i>			•	•			M
Meadow Willow <i>Salix petiolaris</i>				•		•	A
Narrow-Leaved Meadow Sweet <i>Spiraea alba</i>	•			•		•	
Pin Cherry <i>Prunus pensylvanica</i>	•	•	•	•	•		•
Prairie Rose <i>Rosa arkansana</i>	•	•	•	•	•		
Prickly Rose <i>Rosa acicularis</i>	•	•	•	•	•		•
Pussy Willow <i>Salix discolor</i>	•	•		•		•	•
Raspberry <i>Rubus idaeus</i>		•	•	•			M
Red Osier Dogwood <i>Cornus stolonifera</i> spp.	•	•	•	•			M
Sandbar Willow <i>Salix interior</i>		•		•		•	
Saskatoonberry <i>Amelanchier alnifolia</i>	•	•	•	•	•		•
Shining Willow <i>Salix lucida</i>		•		•		•	
Skunkbush <i>Rhus trilobata</i>				•	•		•
Twining Honeysuckle (vine) <i>Lonicera dioica</i> var. <i>glaucescens</i>	•		•	•			M

NATIVE SHRUBS H -attracts hummingbirds N -nectar source L -larval food source A -aspen woodland M -mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Western Snowberry, Buckbrush <i>Symphoricarpos occidentalis</i>	•	•		•	•		•
Wild Gooseberry, Northern Gooseberry <i>Ribes oxycanthoides</i>		•	•	•	•	•	•
Wild Rose <i>Rosa woodsii</i>	•	•	•	•	•		•
Wolf Willow <i>Elaeagnus commutata</i>		•		•	•		•

NATIVE TREES H -attracts hummingbirds N -nectar source L -larval food source A -aspen woodland M -mixed woodland	NATURESCAPES PROJECT TYPE						
PLANT SPECIES	Flower Gardens	Tree/Shrub Nursery	Bird Habitat	Butterfly Habitat	Grassland Habitat	Wetland Habitat	Woodland Habitat
Coniferous							
Black Spruce <i>Picea mariana</i>		•	•	•		•	M
Jack Pine <i>Picea banksiana</i>		•	•	•			M
Tamarack <i>Larix laricina</i>		•	•	•			M
White Spruce <i>Picea glauca</i>		•	•	•			•
Deciduous							
Balsam Poplar <i>Populus balsamifera</i>		•	•	•			•
Paper Birch, White Birch <i>Betula papyrifera</i>		•	•	•			•
Trembling Aspen <i>Populus tremuloides</i>		•	•	•	•		•

4.3 Site Activities

Using Your *Naturescapes* Project as a Learning Site

The integration of educational opportunities with your *Naturescapes* project is key to its overall success. *Naturescapes* are constantly changing, fascinating places, which can help to motivate learning and promote a healthy attitude toward the natural environment. The emotional, social, intellectual and physical development of individuals can all be stimulated by the various components of a *Naturescapes* project.

Fine Arts Opportunities

Art

- Take rubbings from leaves and bark to incorporate into collages or other artwork.
- Draw the plants, animals and insects that live in and around your project.
- Paint pictures of plants, flowers and trees found in your *Naturescapes* project.
- Examine the similarities and differences between the shapes/patterns of leaves, petals, seeds found in your *Naturescapes* project.
- Use the many different “greens” found in your *Naturescapes* project to discuss the concepts of hue, analogous colour, tints, shades and tones.
- Use juice from crushed berries, flowers, leaves and roots to make dyes and paints.
- Make “photograms” from found objects within your *Naturescapes* project by arranging them on light sensitive paper and exposing them to sunlight.
- Braid necklaces and bracelets or wreaths from willow or dogwood bark and twigs harvested from the project.
- Use small branches to provide the frame for weaving projects.
- Make a model of your proposed project; make more than one model to show how the project will mature over time.
- Use waste paper from the school together with dried plant material to make unique papers for art projects, writing paper and posters.
- Create plaques and interpretive signs to be installed on site, describing the purpose of your *Naturescapes* project. There will be a need to change the signage over time as the project matures.
- Exhibit seeds, leaves and other dried plant materials collected between sheets of clear contact paper in the window. After, cut the sheets into strips to use as bookmarks.
- What natural forms and structures found in your *Naturescapes* project can be used as inspiration for three-dimensional sculpture? Could sculptures be put on temporary display in or near the *Naturescapes* project?
- Paint a wall mural in a “larger than life” format depicting the plants and to be found in your *Naturescapes* project on the school or other adjacent building nearby.
- Pavement paintings done in chalk or non-permanent paint on a nearby sidewalk or tarmac are a fun way to interpret a *Naturescapes* project. Take photos or videos of the works before they fade or wash away.
- Use leaves, cones, seedpods and other natural objects for printmaking.

Drama

- Write a play about the creation, purpose and philosophy behind your *Naturescapes* project.
- Videotape performances to share with other schools and community groups.
- Use the *Naturescapes* project site as a performance area.

Music

- Learn about vibration and how to make a crude reed instrument from a thick blade of grass stretched between your thumbs.
- Can whistles or other musical instruments be made from any of the plants in your *Naturescapes* project?
- Make an audio recording of the birds that visit – can you compose music based on the bird song?

Science Opportunities

- Adopt a plant, tree or grouping of plants on the school site that may have been neglected and learn to care for them – pruning, weeding, watering, fertilizing, etc.
- Hand lenses, bug boxes nets and microscopes are indispensable tools for exploring your *Naturescapes* project.
- Study erosion, percolation, evaporation, transpiration and other parts of the water cycle.
- Learn about categorization and identification keys (nomenclature) of plants, animals and insects.
- Study the scientific basis of companion plantings and symbiotic relationships.
- Examine the impact of monocultures on agriculture, the urban environment and the world at large.
- Study soil composition in different locations and how this, in combination with the climate, determines the vegetation that is able to grow.
- Frost and ice – study how plants are able to live through the cold winter. How does frost kill and then break down organic matter?
- Learn how compost improves soil texture and water/nutrient holding capacity.
- What are the effects of chemical fertilizers on soil?
- Categorize the different types of seed dispersal found in nature.
- Learn about pollination by bees and other insects.
- Research appropriate designs for bird nesting boxes.
- Set up a weather station in the *Naturescapes* project; compare differences in wind speed, temperature, rainfall, and dust particulates in open areas vs. sheltered areas.
- Chart sun and shade patterns on a proposed site before implementing the project to determine where to locate various plants according to their light requirements.
- Conduct environmental assessments that test soil and air quality, including soil compaction and pH. How do these factors affect plant growth and/or the presence of animals?
- “Lasso the Earth” by tossing 1m sq. loops of stiff wire at random on various sites. Using a fork or spoon, explore the populations and diversity of plants, animals, insects and non-

living items, etc. found within the loop. Document and compare the results of different sites within the *Naturescapes* project. This project is modelled on the way scientists (particularly botanists) conduct field research to sample biodiversity by using “quadrats”.

- Learn mapping skills and standards such as scales, legends, contour lines and prepare a site plan.
- After construction is complete, plot your project on graph paper (including all plant locations, sizes, canopy diameter, tree trunk caliper/diameter) to learn about mapping and cartography; use the map to compare how the project grows and changes over time.
- Learn about the concepts of orientation, direction, and sunpath by learning to use a compass. Understanding these concepts will help in developing the site plan for the project.
- Grow garden plants such as marigolds and cosmos, and then follow their cycle through blooming, pollination (watch bees and butterflies carrying this out) and fall seed collection.

Math Opportunities

- Throughout the planning, development and implementation of your *Naturescapes* project, concepts such as perimeter, circumference, diameter, volume, angles, ratio and scale can all be explored with a “hands on” approach. After the project is completed, mapping all the elements of the site can reinforce the above concepts.
- Chart and graph growth rates of plants.
- Calculate the volume of soil required for a project, or the volume of water required for a growing season.
- Calculate the canopy cover of individual trees and plants, i.e., how much area does the plant cover? Botanists use this as one way of determining the relative dominance of a plant species in a given area. (Hint: Imagine shining a light directly above the plant and the shadow it would cast on the ground).
- Estimate growth rates, or the speed of flying insects.
- Learn about fractions and decimals in comparing plant heights.
- Calculate dimensions and areas on the site plan to determine quantities of materials required for the project.
- Give those involved a sample budget and ask them to develop a budget for your project.
- Measure the diameter, circumference, radius and length of vegetables grown in the garden.
- Find the fulcrum point of a shovel applied to digging out a rock; calculate how many pots are needed for the number of seeds you have if you plan to put three seeds in each pot; find the area of your garden and calculate how many cubic metres of topsoil you’ll need to cover the area to the required depth; chart the growth rate of plants or levels of rainfall.

Computer Opportunities

- Create a *Naturescapes* web site for the world to see. Some examples can be found at the Evergreen Foundation web site.
- Two plants could be selected - one in shade, the other in full sun. Measure their growth, record the results, and then plot the data on graphs, comparing the results for each plant.

- Using a suitable word processing program with graphic capabilities, develop a “field guide” to your *Naturescapes* project. Each student could be responsible for an individual plant, animal, bird or insect that has been observed in the *Naturescapes* project.
- Participate in “Plantwatch”, a phenology (study of the seasonal timing of life cycle events) program run by the Devonian Botanic Garden. Students report the blossoming time of common plants like Saskatoon Berry and Common Purple Lilac via the Internet or e-mail to the Research Coordinator at Devonian Botanic Garden in Edmonton. The information provides a way of measuring the arrival of spring and to understand some of the effects of climate change. See Section 4.5 for web site and contact information.

Social Studies Opportunities

- Study the history and development of various plants and vegetables in relation to human settlement and culture (e.g. potatoes, wheat, and canola).
- Study the early settlers’ use of different plants and crops. What were the important foods at the table of a typical farm family in the Edmonton region in 1890?
- Bring in local First Nations’ elders and teachers to talk about the role of the native/regional landscape in their lives.
- Research the life of Carolus Linnaeus (1707-1778), the Swedish botanist who published the taxonomic (naming) system for plants and animals which is the basis for the binomial (two name: genus + species) system used today.
- Explore the history of the forms, meaning and role of gardens in different cultures around the world. For example, compare a typical Middle Eastern courtyard garden with a Japanese garden – compare and contrast these two types of gardens.
- First Nations’ peoples used native plants to make the necessities for all facets of daily life: food, medicine, dyes, baskets, canoes, tools, etc. Learn how it was possible to “live off the land” in times past. Visit the Alberta Provincial Museum to learn more about First Nations people.
- All the objects we use in daily life are still directly or indirectly derived from the land, but most of the time we purchase them from others. What plants are important to us today?

Language Arts / Communications Opportunities

- Write letters to prospective contributors to your *Naturescapes* project.
- Write plays, announcements or even a newsletter to communicate information throughout the school.
- Improve sensory expression—taste, touch, smell, sight, and sound—in writing and poetry.
- Use ecological interrelationships between plants and animals as a basis for non-fiction writing.
- Write directions for planting and care of individual plants.
- Use journals to record the progress and growth of a *Naturescapes* project.
- Research folklore about native plants and animals.
- Use the *Naturescapes* project site as a place for silent reading.

- Make a “poet-tree”, a bulletin board where poems or other writing that is inspired by a *Naturescapes* project can be posted. Write letters or stories from the point of view of a plant, rock or animal.

Physical Education Opportunities

- Hold “warm up” and “cool down” sessions within or near your *Naturescapes* project.
- A *Naturescapes* project could potentially be incorporated into a variety of outdoor activities such as creative dance, gymnastics, obstacle courses, camouflage games and tai chi.

Health Opportunities

- How does the *Naturescapes* project site improve the quality or “wellness” of our lives?
- Explore the medicinal values of plants. Learn how plants are the basis for almost all manufactured pharmaceuticals.
- How do plants breathe? How do they clean the air we breathe?

Personal and Group Development Opportunities

- Have various professional, technical, scientific and business people visit the classroom to speak about their careers and how it relates to the environment: landscape architects, horticulturists, nursery workers, planners, surveyors, geographers, ecologists, naturalists, biologists, landscape contractors, plant geneticists, historians...etc.
- Construct bird nesting boxes and feeders, then install and maintain them in your *Naturescapes* project.

4.4 Reference Material

All sources marked with an *asterisk have been used in the preparation of this resource document.

Outdoor Classrooms

*The Outdoor Classroom – A Canadian Newsletter on School Ground Naturalization. Published by the Evergreen Foundation. Contact: Editors at #106 – 163 West Hastings Street, Vancouver BC V6B 1H5 Tel: (604) 689-0766 Fax: (604) 689-0768

Gardens

Acorn, John. Butterflies of Alberta. Edmonton: Lone Pine Publishing, 1993.

Alberta Horticulture Guide. Edmonton: Alberta Agriculture, Food and Rural Development, 1994.

*Bird, C.D., Hilchie, G.J., Kondla, N.G., Pike, E.M. and F.A.H. Sperling. Alberta Butterflies. Edmonton: The Provincial Museum of Alberta, 1995.

Butler, Elaine. Attracting Birds. Edmonton: Lone Pine Publishing, 1993.

*Community Gardening – A Handbook for Planning and Creating Community Gardens in Edmonton. Environmental Resource Centre.

Excellent local resource with links to other sites related to: botanical gardens, horticulture, gardening, etc.

*Hole, Lois. Lois Hole's Northern Flower Gardening – Perennial Favourites. Edmonton: Lone Pine Publishing, 1995.

Hole, Lois. Lois Hole's Northern Vegetable Gardening. Edmonton: Lone Pine Publishing, 1995.

Garden Trees for Attracting Birds. Edmonton: Federation of Alberta Naturalists.

Moss, E.H. Flora of Alberta. Toronto: University of Toronto Press, 1959.

Pearman, Myrna. Nestboxes for Prairie Birds. Lacombe, AB.: Ellis Bird Farm Ltd.

Pearman, Myrna. Winter Bird Feeding. Lacombe, AB.: Ellis Bird Farm Ltd., 1991.

*Vick, Roger. Gardening on the Prairies – A Guide to Canadian Home Gardening. Saskatoon: Western Producer Prairie Books, 1987.

Web Sites

Butterfly Web Site: <http://mgfx.com/butterfly/resource/index.htm>

City Farmer Web Site: <http://www.cityfarmer.org/>

Devonian Botanic Garden Web Site: <http://www.discoveredmonton.com/devonian/dbg.html>

Dig the Net – the World of Gardening Online <http://www.digthenet.com/>

The Garden Gate Web Site: <http://www.prairienet.org/ag/garden/>

Gardenweb Web Site: <http://www.gardenweb.com/>

I Can Garden Web Site: <http://www.icangarden.com>

Don't miss this web site! An amazing resource with links to other related sites across Canada and the world. Has topics such as: "kidz korner", "horticultural issues", "catalogues", "gardens", etc.

The Virtual Gardener: <http://www.gardenmag.com/cover.html>

Native/Regional Landscapes

Cormack, R.G.H. Wildflowers of Alberta. Edmonton: Hurtig Publishers, 1977.

Finnamore, A.T. The Sustainable Arid Grassland Project. (Article) Edmonton: Provincial Museum of Alberta, 1996

*Gerling, H.S., M.G. Willoughby, A. Schoepf, K. E. Tannas and C. A. Tannas. A Guide to Using Native Plants on Disturbed Lands. Edmonton: Alberta Agriculture, Food and Rural Development, 1996.

*Habitat Development Fact Sheet No.12 “Building Nest Boxes for Cavity Nesting Birds”. Alberta Fish and Wildlife Division.

Hosie, R.C. Native Trees of Canada. Forestry Service Canada and Environment Canada, 1973.

*Knowles, Hugh. Woody Ornamentals for the Prairies. Edmonton: University of Alberta Faculty of Extension, 1995.

*Looman J. and K. F. Best, Budd’s Flora of the Canadian Prairie Provinces. Hull: Canadian Government Publishing Centre, Supply and Services Canada, 1979.

*Low Maintenance Landscaping – a Step-by-Step Guide. Edmonton/Sherwood Park: Alberta Community Development and the Alberta Naturalization Network Society, 1995.

*Morgan, John P., Douglas R. Colicutt and Jaqueline D. Thompson. Restoring Canada’s Native Prairies – A Practical Manual. Argyle, Manitoba: Prairie Habitats, 1995.

Mulligan, G.A. Common Weeds of Canada Field Guide. Ottawa: NC Press, Ltd., Agriculture Canada and Canadian Government Publishing Centre, Supply and Services Canada, 1989.

*Toop, Edgar. Annuals for the Prairies. Edmonton/Saskatoon: University of Alberta Faculty of Extension, Lone Pine Publishing, and the University of Saskatchewan Extension Division, 1993.

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*Vance, F.R., Jowsey, J.R. and J.S. McLean. Wildflowers Across the Prairies. Saskatoon: Western Producer Prairie Books, 1984.

Wolff, Earl. Common Pond Invertebrates of the Edmonton Area: A Teacher’s Guide. Edmonton: University of Alberta Devonian Botanic Garden.

Web Sites

Evergreen Foundation’s Ecology Resource Network: <http://www.evergreen.ca>

Grassland Ecoregions of the Canadian Prairie Provinces:

<http://www.cciw.ca/eman-temp/ecozones/ecoregion-156.htm>

Living Prairie Museum Web Site (Winnipeg, Manitoba):

<http://www.mbnet.mb.ca/city/parks/envserv/interp/living.html>

Stewardship Projects

Appelhof, Mary. Worms Eat My Garbage. Kalamazoo, MI: Flower Press, 1982.

Denyer, W.B.G. and W.J.A. Volney. Urban Home Composting – A First Step in Recycling. Edmonton: Forestry Canada, Northwest Region, Northern Forestry Centre, 1992.

General

Philip, Hugh and Ernest Mengersen. Insect Pests of the Prairies. Edmonton: Faculty of Extension, University of Alberta, 1989.

Landscaping Alberta Yards. Alberta Agriculture, 1990.

Web Sites

Environment Canada “Green Lane” – Prairie and Northern Region Web Site:

<http://www.mb.ec.gc.ca/ENGLISH/>

Has information on topics such as: weather, land, water, life, ecosystems and pollution. Links to other national and international environmental sites.

“Plantwatch” Web Site (U of A): <http://www.biology.ualberta.ca/devonian.hp/pwatch.htm>

Plantwatch is a phenology (study of the seasonal timing of life cycle events) program where students report the blossoming time of common plants like Saskatoon Berry and Common Purple Lilac via the Internet or e-mail to the Devonian Botanic Garden. The information provides a way of measuring the arrival of spring and to understand some of the effects of climate change. Contact: Research Associate, Devonian Botanic Garden, University of Alberta, Edmonton, AB. T6G 2E1 Tel: 987-5455/3054 Fax: 987-4141

Schools/Education

*George, Linda. Greening Your School Ground – A Working Manual. Environmental Educators’ Provincial Specialist Association, 1995.

*Green Teacher – Education for Planet Earth. Published 5 times per year. Contact: General Editors at Green Teacher, 95 Robert Street, Toronto, ON M5S 2K5 Tel: (416) 960-1244 Fax: (416) 925-3474 E-mail: greentea@web.apc.org

*Pegis, Jessica, ed. A Guide to School Ground Naturalization – Welcoming Back the Wilderness. The Evergreen Foundation. Scarborough: Prentice-Hall Canada, Inc., 1994.

*Stoyke, Godo. Environmental School Program: A Teacher’s Guide (Second Revised Edition). Edmonton: Friends of the Garden, Devonian Botanic Garden, University of Alberta, 1996.

Tersigni, John, ed. The Green Brick Road – Guide to Environmental and Global Education. Proving Graphics, Ltd., 1995.

Institutions and Agencies

City of Edmonton:

Principal of Horticulture (Community Services), Tel: 496-6997

East Social and Recreation Services, Northeast Site, Tel: 496-1901

Central and River Valley, Tel: 496-7275

South Social and Recreation Services, Southwest Site, Tel: 496-4700

South Social and Recreation Services, Southeast Site, Tel: 496-1475

West Social and Recreation Services, Northwest Site, Tel: 496-7320

Master Composter Program, Tel: 496-5991

Edmonton Public Schools:

Land Development, Tel: 429-8447

Edmonton Catholic Schools:

Facilities Office, Tel: 453-4500

Environmental Practices Facilitator, Tel: 453-4510

Alberta Government:

Environmental Protection, Tel: 944-0313

Federal Government:

Canadian Forest Service, Tel: 435-7210

Environment Canada, Prairie and Northern Region, Tel: 951-8600

Tree Canada Foundation, Tel: (613) 567-5545

University of Alberta:

Earth and Atmospheric Sciences Department, Tel: 492-3265

University of Alberta Devonian Botanical Garden, Tel: 987-3054

Other:

Alberta Association of Landscape Architects, Tel: 435-9902

Alberta Horticultural Society

Alberta Native Plant Council Box 52099, Garneau Postal Outlet Edmonton, AB T6G 2T5

Environmental Resource Centre, Tel: 433-8711

Federation of Alberta Naturalists, Tel: 453-8629

Landscape Alberta Nursery Trade Association, Tel: 489-199

Local Suppliers

Contact the Landscape Alberta Nursery Trades Association (LANTA) for information on suppliers of landscaping material. Tel: 489-1991

See the Yellow Pages under the following headings:

Birds

Garden Centres

Garden Equipment and Supplies

Horticultural Consultants

Laboratories Analytical (soil testing)

Laboratories Testing (soil testing)

Landscape Architects

Landscape Contractors and Designers

Landscaping Equipment and Supplies

Tree Service

Tree Service Equipment

Potential Funding Sources

Alberta Ecotrust Fund
Tel: 1-800-465-9202 Fax: (403) 233-9202

Alberta Forestry Association, "Forever A Tree Project", #101 Alberta Block, 10526 Jasper Avenue, Edmonton, AB. T5J 1Z7

Alberta Sport, Recreation, Parks and Wildlife Foundation
Tel: (403) 482-6467 / 496-4920 Fax: (403) 488-9755

Canada Trust - Friends of the Environment Foundation, contact local branches

City of Edmonton – Community Services
Neighborhood Park Development Program (NPDP)
Neighbourhood Park Tree Program
Contact: District Community Recreation Coordinator (CRC)

The Clifford E. Lee Foundation Tel: (403) 423-4674

Community Facility Enhancement Program Tel: (403) 447-8818

Edmonton Community Foundation Tel: (403) 423-4461

Environment Canada – Eco Action 2000 Program. Rm. 200, 4999 - 98 Avenue, Edmonton, Alberta, T6B 2X3. Tel: (403) 951-8710

Evergreen Foundation, Contact: School Ground Naturalization, The Evergreen Foundation 355 Adelaide St. W. Suite 5A, Toronto, ON M5V 1S2. <http://www.evergreen.ca>

Flora Trust, Tel: (403) 986-5954

Global Releaf Fund, Friends of the Earth 251 Laurier Avenue West, Ottawa, ON. K1P 5J6, Tel: (613) 230-3352

Habitat Canada 2000, Canadian Wildlife Federation, 2740 Queensview Drive, Ottawa, ON K2B 1A2, Tel: (613) 721-2286

Imperial Oil, Tel: (416) 968-4477 Fax: (416) 968-4885

Interprovincial Pipe Line Inc., Tel: (403) 420-5306 Fax: (403) 420-8253

Molson Companies Donations Fund
A corporate foundation active in each province. Contact the nearest Molson's office for application information.

Monsanto Canada, Tel: (416) 968-4477 Fax: (416) 968-4885

Mountain Equipment Co-op, Tel: (604) 732-1989

Actively supports environmental, social and other projects, which benefit its members and customers.

Rotary Clubs

Shell Environmental Fund

c/o Shell Canada, P.O. Box 100, Station M, Calgary , AB. T2P 2H5

Tel: 1-800-661-1600 or (403) 283-9558 / 691-2071 Fax: (403) 283-9576

Volunteer Support Fund, Tel: (403) 495-4485 Fax: (403) 495-4367

Wildlife Canada, Tel: (613) 722-2090 Fax: (613) 722-3318