



School Ground Greening

A policy and planning guidebook



Part of the Tool Shed Series

Toyota Canada Inc. and its Dealerships – Proudly supporting outdoor classrooms in Canadian schools.

SCHOOL GROUND GREENING



Evergreen and Toyota Canada Inc. with its Dealerships are working together to ensure that children's school environments are as nurturing as possible. The Toyota Evergreen Learning Grounds Program represents a commitment to contribute positively to the health and well-being of future generations by educating children about the importance of restoring and preserving the environment. Teachers, students and community members are invited to participate in a nation-wide effort to reclaim Canada's school grounds and to create healthy learning environments.

Toyota Evergreen Learning Grounds Charter

The Evergreen and Toyota Canada Inc. partnership represents a shared commitment to positively contribute to the improvement of school grounds and the natural environment in order to enhance the emotional and physical development of Canada's children.

We believe that the provision of educational resources and the support of caring citizens will transform school grounds into healthier, more dynamic places for learning.

We believe that by combining Toyota's commitment to corporate social responsibility with Evergreen's ecological restoration practices we will enhance our combined reach and the quality of business, community and learning.

We commit our organizations to lead by example, and to provide measurable and meaningful resources and support to Canada's schools and to the communities in which we work.

It is our sincere intent to foster a new spirit of community involvement and environmental stewardship within the hearts and minds of Canada's future: children and youth.

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**By what is included or excluded
we teach students that they are part
or apart from the natural world.**

David Orr, 1991

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PREFACE

Over the past decade, school ground improvement projects in Canada have multiplied significantly. This trend continues to grow, with improvement projects ranging from greening initiatives involving tree plantings, food gardens, and habitat areas, to enhanced play and gathering spaces involving such things as boulders, planter boxes and amphitheaters.

The intent of such projects vary from expanding the classroom curriculum to offering children more engaging play spaces, increasing their environmental awareness, or providing shade against harmful UV rays. Often, the impetus for such projects come from parents and teachers, who then go on to work with various school district staff through the planning, design, approval and maintenance phases.

While few will disagree with the merit of such initiatives, the ‘newness’ of the movement combined with the rapid growth in number of projects has presented significant challenges for those involved in reviewing and approving greening projects. For many school boards and maintenance departments, there is a lack of formal, written, easy-to-access policy or regulations to guide project processes. In addition, there is often a lack of standards and educational and environmental rationale for the many different components of such projects.

The gap in policy and program support at the local level is mirrored by a lack of guidance for learning landscapes at the provincial level. While government ministries of education usually provide standards for new school buildings, they all too rarely provide policy guidelines that require the use of school grounds as educational resources. This leaves a policy vacuum that is filled unevenly by each district reacting to school proposals.

There are, however, some notable exceptions across the country to these situations, along with key individuals leading policy and programming initiatives designed to better support school ground greening.

Using examples, recommended policies and practices, and environmental and educational rationales for various project components, this document aims to assist school district staff and school board officials craft regulations, guidelines, agreements and policies that will ensure greening projects are properly planned, implemented and maintained.

This document is applicable to school greening projects across Canada. It is recognized, however, that there are considerable regional differences in climate, legislative context, organizational structure and experience with greening projects. This document is intended to provide a starting point from which progressive greening policy and practice can evolve to accommodate the unique set of circumstances faced by each school district.

ACKNOWLEDGEMENTS

Research used to produce this document involved contacting school ground managers, facilities managers, operations directors, maintenance departments and others across the country to explore what has already been done to effectively guide the greening process.

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Introduction

The modern Canadian school ground landscape is often a shockingly barren and sometimes even hostile environment for children to grow and develop in. Sterile expanses of asphalt and turf surrounded by chain-link fences make for institutional landscapes that do not promote schools as sanctuaries for learning. There is mounting evidence to show that such landscapes contribute to anti-social behavior such as bullying and vandalism because children are insufficiently stimulated and have no quiet place in which to develop positive, caring relationships. Inadequate shade affords little protection from harmful ultraviolet rays, too many hard surfaces promote injuries, and a lack of natural habitat deprives children of the opportunity to learn about nature and develop a deeper connection with, and understanding of, ecological processes.

Parents, teachers, administrators and school ground managers across the country have begun to recognize the significant benefits associated with the conversion of asphalt and turf into landscapes that educate, inspire and support local ecosystems. Consequently, the last few years have seen an increasing number of proposals to redesign school landscapes. This growing demand has presented significant challenges for school districts not yet equipped with supportive policy, design frameworks, maintenance strategies or even funding.

The question, then, is how to bridge the gap between existing school ground conditions and ideal landscapes that integrate the educational, cultural, social and health needs of students and the larger community. Recognizing that the best landscapes are dynamic, unique spaces that help to create a sense of place and inspire and transform people's connections with each other and the natural world is only the first step. A better understanding of what such landscapes can look like, in practical terms, must be developed, and then the right mechanisms to assist land managers and school community members with the creation and support of on-the-ground change must be put into place.

WHAT IS SCHOOL GROUND GREENING?

School ground greening is a catch-all term for landscaping projects on the school ground that have social, educational, aesthetic and/or environmental dimensions. The term *greening* is meant both literally (converting asphalt into green vegetated areas) and metaphorically (enhancing school yards as places of ecological diversity and reducing the impact of schools on ecosystems). *School ground naturalization* (creating and restoring naturalized landscapes with predominantly native species) is one very important component of greening. However, greening may extend to encompass wider environmental issues such as stormwater management and energy

consumption. Greening projects should also be concerned with the educational value of the school landscape and provide enhanced opportunities for formal and informal learning, cooperative social interaction and increased beauty and interest in the school landscape. Ideally, academic education and recreational sports should be balanced with the new imperatives of environmental responsibility, ecological education, hands-on learning and positive social relationships.

Developing communities that support a strong economy and vibrant social and cultural networks without degrading the vital ecological systems that sustain life is an ongoing challenge for us all. Schools are part of this struggle in two important ways:

- 1) Schools typically occupy a large land area and school operations use a significant amount of energy and resources. Schools, therefore, have sizable opportunities to reduce their *ecological footprints*, contributing significantly to overall community sustainability.
- 2) The values that children learn and adopt at school will be reflected in their choices and attitudes as adults. It is not only their formal education in the classroom but also the hidden messages of the landscape that will affect their mental and physical development.

It is evident that young people interact with the whole environment. School grounds function as settings for the formal and informal curriculum in schools but also as a medium for the transmission of messages and meanings inherent in the hidden curriculum of schools...The appearance of the school ground...reflect[s] the ethos of the school and communicate[s] in subtle ways something of its attitude to young people and the value we place on them.

Adams, 1990

BARRIERS AND OBSTACLES

School ground managers across the country consistently point out that while they support the concept of greening projects in principle, they must be properly planned, designed, built and maintained if they are to be a lasting part of the school landscape. While there have been many successful greening projects developed in recent years, it is generally recognized that school ground greening poses several challenges that must be addressed. These include

- ministry and school board policies that ignore or intentionally discourage greening;
- diminishing budgets for maintenance departments;
- student and volunteer safety and liability concerns;
- balance among the many uses of school ground spaces, including recreation and education;

- school yard use by outside community interests;
- balance between high-activity spaces that can sustain use by many students and gentler landscapes that can withstand only limited use; and
- vandalism and other crime in the school yard.

Making the transition from a nearly exclusive focus on field sports and maintenance simplicity to one that includes learning, contact with nature and ecological responsibility is a challenge for all school boards, but it is clearly worthwhile. Those schools that have made the effort to green their grounds have seen great rewards in terms of improved learning opportunities, reduced school yard vandalism and other anti-social behavior, and increased pride in the school.

Through the application of good policy, careful planning and wise landscape management, the challenges are surmountable. It is the purpose of this document to illustrate how these issues might be tackled.

SUCCESSFUL APPROACHES

It is possible, even within limited budgets, to devise approaches to school ground greening that really work in the short and long terms. Some school boards have made significant progress in developing approaches to planning, designing, constructing and maintaining projects that ensure success. Some have hired landscape facilitators to guide schools through a comprehensive redevelopment of their grounds. Others have provided detailed guides to the greening process, suggested funding sources or required adherence to a strict set of rules. Still others have taken an approach that establishes a formal agreement between school board and school so that lines of responsibility are clear.

Lessons from Elsewhere

In some cases, school districts have the benefit of supportive policy at higher levels. Recent legislation in the United States, the United Kingdom and other countries has made greening initiatives even more relevant and provides the appropriate context within which to operate.

Environmental regulations in the State of Maryland regarding trees, forested areas, wetlands, streams and sediment/stormwater control require new school site environmental options to be developed. In response, the Maryland State Department of Education (1999) has developed an environmental education bylaw that requires students to receive interdisciplinary environmental education that is partly delivered through innovative school landscape programming. Says Nancy S. Gramick, state superintendent of schools, in the foreword to *Conserving and Enhancing the Natural Environment* (Maryland State Department of Education, 1999):

Our perception of a public school site has changed from a limited educational resource, primarily supporting physical education and

recreational activities, to a rich outdoor classroom supporting all aspects of the curriculum. Conserving and enhancing the natural environment on school sites in the form of forests, wetlands, meadows, streams, rain gardens, or native landscaping meets this vision. Natural environments on school sites provide a wealth of multi-disciplinary educational opportunities, many of which are “hands-on” experiences that stimulate learning.

Recognizing the threats to biodiversity and natural habitats, and the crucial role of education, the U.S. National Wildlife Federation (1999) has resolved to support “the development of wildlife habitat at schools nationwide. “It has recognized that “[school yard] wildlife habitat projects go beyond conservation, preservation and creation of wildlife habitat; that they are areas to be used by schools to teach about and instill an appreciation for wildlife and direct first-hand experience in our natural environment.”

Notably, the California Board of Education promotes school gardens as part of an overall program to improve child nutrition as well as develop progressive educational opportunities. In 1999, the California legislature passed a bill that built upon the 1995 initiative by Delaine Eastin, state superintendent of public instruction, to create “a garden in every school” in recognition of the many benefits of school garden programs.

By encouraging and supporting a garden in every school, we create opportunities for our children to make healthier food choices, participate more successfully in their educational experiences, and develop a deeper appreciation for the environment, the community, and each other.

California Nutrition Education and Training Program, 1999

In the United Kingdom, the Learning Through Landscapes Trust was born out of a partnership between the national Department of Education and 12 local education authorities. The trust has successfully pursued a greening agenda with numerous educational materials and given direct support to many progressive school ground designs (Young, 1990).

Closer to home, the Canadian Biodiversity Strategy, Canada’s contribution to the UN Convention on Biological Diversity, calls for municipalities to develop incentives and policy to conserve and enhance biological resources. Canada’s commitment to the Kyoto Protocol on greenhouse gas emission reductions will require multi-sector participation. Schools can play an important role in achieving those targets.

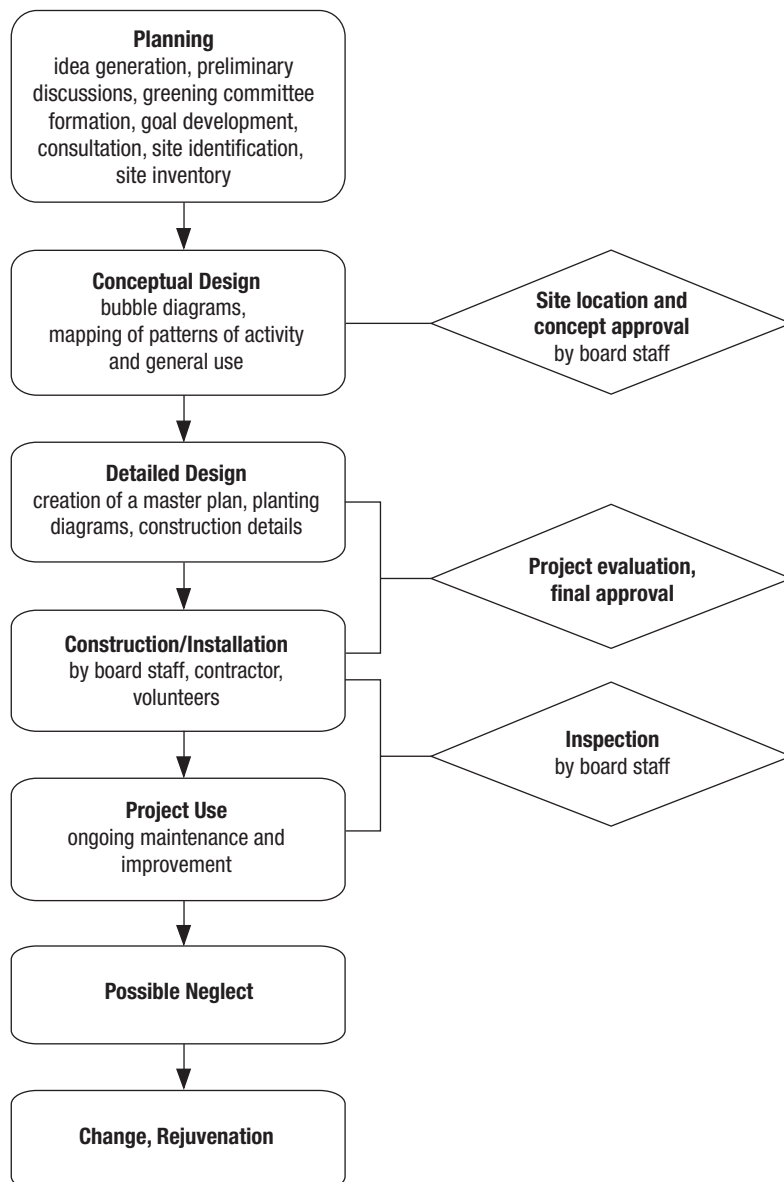
STAKEHOLDERS' ROLES AND RESPONSIBILITIES

School ground greening involves many different stakeholders. The process of greening can be supported at different levels in numerous ways. The following list offers some suggestions.

Ministries of Education	Form the provincial policy and fiscal context within which boards operate. They can show their commitment to school ground greening through policy directives and funding.
School Board Trustees	Create and oversee school policy. Trustees can demonstrate their commitment through policy that supports community-based greening processes.
School Ground/Facilities Managers	Are usually the key staff representing school districts in the greening process and the primary point of contact for schools. Grounds managers have valuable hands-on information that can inform the policy-making process. They often work side by side with trustees, and occasionally provincial representatives, to create greening policy.
School Board Superintendents	Oversee all educational and operational services delivered locally. They can be effective champions of greening projects, especially with respect to the integration of curricula and site planning and maintenance.
Principals	Ensure that teaching staff have the resources and support needed to maximize the educational potential of school grounds. They are responsible for setting goals for school performance and may be looking to meet these goals through school ground improvements.
Teachers	Sit on greening committees and develop curriculum links. School landscapes can become incredibly valuable teaching resources for educators.
Students	Can be involved in all aspects of greening projects, which develop a sense of active citizenship and stewardship and provide experiential learning opportunities.
Parents/Community Volunteers	Can offer their services as professionals (landscape architects, architects, planners, naturalists, engineers, etc.) or assist with various planning and planting tasks. They can provide input into the policy-making process by demonstrating support for change and can also be creative resources in identifying alternative approaches to issues surrounding such things as budgeting, maintenance and design.
Outside Agencies	Fill the voids in funding and information support, increasingly so as provinces and territories reduce school operating budgets. Non-profit organizations such as Evergreen and Tree Canada provide advice, publications, grants and lobbying efforts to ensure that interest in greening does not evaporate due to lack of coordinated effort.
Design Professionals	Can lend valuable credence to design and policy development. Architects, landscape architects and planners are trained in the functional design of space and the conversion of good ideas into realistic plans. In addition, naturalists and habitat biologists/ecologists understand the intricate relationships among the diverse elements of a natural landscape.

OVERVIEW OF A GREENING PROJECT

The development of a successful greening project that stays well maintained and viable and provides diverse educational opportunities for many years requires good planning, hard work and dedication. As Rob Illick of the Calgary Board of Education points out, “Many schools just can’t wait to get the project done, but much of the benefit of [school yard] greening is in the process itself” (Illick, 2001). The following diagram is an outline of the basic steps involved in most greening projects. The remainder of this document details those steps.



Chapter 1

POLICIES AND GUIDELINES

School ground greening policies and guidelines should offer clear direction for applicants as well as a consistent and transparent way for staff to evaluate the proposal.

THE ROLE OF POLICY

Policy sets forth the purposes and prescribes in general terms the organization and program of a school system. Policy is future-oriented and facilitates management through long-term planning rather than on an ad hoc basis. It prescribes a set of overall goals and a general course of action. In other words, it states *what* a school board will do in the future and *how* it will do it (BCSTA, 1998).

At present, most greening projects are developed in a policy vacuum; that is, without a coherent framework of objectives and guidelines to direct both the proponent and the approving officer. That means that decisions are often made on an ad hoc basis without a set of transparent standards. Therefore, changes to the school landscape do not necessarily reflect the principles of the school board and may fail to match expectations on all sides.

Policy can be created that instead clearly addresses the purpose of outdoor space around schools, articulating the connection between enhanced learning, student social development, student health and landscapes supportive of local ecosystems.

POLICY CONTEXT

Any policy for school yard greening will, of course, be developed within the context of other existing policies, such as provincial legislation governing education and the environment or sections of municipal plans that deal with the protection and management of open space. In addition, the existing policies of the school board concerned with facilities management, play structures, grounds responsibilities and environmental education should be considered before and during the formation of greening policy to ensure that greening policy aligns with the overall intent of higher-level policies.

Opportunities exist to create supportive frameworks for greening at all levels. For example, Canada's proposed species at risk act, the Canadian Biodiversity Strategy, and Agenda 21, which calls for local action to promote the sustainable use of resources, can all help to guide policy development while also allowing school

ground greening to link with regional and even national environmental commitments. Support and guidance can further be found in international agreements. For instance, the imperative to create educational spaces that best serve the child is reflected in Principle 7 of the Declaration of the Rights of the Child (United Nations, 1959). It states:

The child...shall be given an education which will promote his general culture and enable him, on a basis of equal opportunity, to develop his abilities, his individual judgement, and his sense of moral and social responsibility, and to become a useful member of society. ...The child shall have full opportunity for play and recreation, which should be directed to the same purposes as education.

DEVELOPING POLICY

Developing policy to guide school ground greening requires that the connection between enhanced learning, student social development, student health and landscapes supportive of local ecosystems be articulated. That means that those who are crafting policy need to have a clear idea of what types of projects will best meet student needs. There are additional key issues that will need to be addressed.

Ask This!

- *What are the key educational and environmental criteria by which projects will be evaluated?*
 - *What process will be used to approve greening projects?*
 - *Who will be responsible for evaluating, approving, designing, installing and maintaining greening projects?*
 - *What level of commitment to funding and other support will be made available for greening projects?*
 - *What will be the role of government departments and other agencies approached for additional funds, expertise, etc.?*
 - *How will different uses (such as sports and gardening) be balanced and integrated into the school landscape?*
 - *How will greening considerations be incorporated into the selection of new school property and the design of new school grounds?*
-

Policy should reflect the values of the school community and steer the course of action for staff, parents and outside agencies. Some of the strongest values to have emerged and found expression in school ground greening include

- the desire of children to play in natural settings;
- the teaching of environmental ethics by example;

- the recognition that outdoor play space is as important as indoor classrooms and that natural settings offer increased opportunities for social and intellectual development;
- the emerging environmental imperative to develop landscapes that provide wildlife habitat and enhance ecosystem functions; and
- the imperative to develop healthy, sustainable communities by reducing the amount of water, energy and material consumption, and the pollution of air, water and land.

In addition to linking desired goals with prescribed action and being consistent with and supportive of other policies, well-crafted policy should acknowledge conflicting values and trade-offs.

One of the most comprehensive policies on school grounds comes from the Nova Scotia Department of Transportation and Public Works. *Design Requirements for Educational Facilities* (2001) speaks to the need for school site design to respect the physical environment and clearly addresses the role played by school landscapes in protecting children's health and instilling environmental ethics.

In the policy, it is recommended that existing habitats on-site be conserved and that other natural areas be restored through native plantings. In fact, each school site is to include a minimum of one natural feature, such as a meadow, a woodland or a wetland. Such areas are furthermore meant to present learning opportunities through environmental education programs that are cross-curricular.

A Hypothetical School Board Greening Policy

The board recognizes the ability of school ground greening to

- create opportunities for children to play and learn in natural settings that allow them to explore, manipulate objects, extend their physical activity and fulfill their need for complete and healthy development;
- teach an environmental ethic by example and raise ecological consciousness in both children and adults;
- offer increased opportunities for social and intellectual development;
- provide appropriate wildlife habitat and enhanced ecosystem functioning;
- reduce the use of chemical fertilizers and pesticides;
- contribute to the wider imperative to develop healthy, sustainable communities by reducing the amount of water, energy and material consumption, and the pollution of air, water and land; and
- provide shade from the sun and protection from harmful materials and substances.

Therefore, the board will encourage schools to develop school ground greening projects and shall, when possible, support greening initiatives by

- instructing staff to prepare a simple approval process for greening projects;
- developing an explanatory guide to the greening process;
- allocating (in conjunction with the grounds department) a proportion of maintenance budgets to be spent on greening projects; and
- lobbying the provincial Ministry of Education for adequate fiscal support for greening and the development of training initiatives for teachers and grounds staff.

All school ground greening proposals must be evaluated by the maintenance manager in the context of the above-noted goals and with regard to the guidelines for school ground greening developed by maintenance services and approved by the board.

The policy expressly commits to the design of landscapes that minimize the effects of off-site pollution, including noise, smoke and exhaust fumes.

The most welcome portion of the policy is that which speaks directly to environmental education. The policy commits school boards to providing hands-on learning experiences through problem-solving and project-based activities that involve the school ground landscape. In addition, it recognizes that natural surroundings meet the need of children to play in aesthetically pleasing, creative and safe environments, and that an improved school ethos and sense of ownership and stewardship evolve out of receiving input from stakeholders of a new or renovated site. A commitment is made to leave room for creative design of grounds by the school community upon occupation.

In addition to policy, which is usually developed at the board level, grounds managers may develop regulations, guidelines and procedures that pertain to the greening of school yards. These should provide a higher level of detail than policy and address such things as the items that should be contained in a proposal and the components and plants that should be encouraged and discouraged. Guidelines should be set about such things as site location, access, and the separation or integration of the project with respect to other uses. Requirements for volunteer agreements should be set. And maintenance requirements as well as sunset clauses to deal with project neglect and rehabilitation should be addressed.

Nova Scotia Sets Landscape Design Requirements for Schools

The Nova Scotia Department of Transportation and Public Works (2001) has produced a design requirements manual. It provides information on site engineering and zoning and the following direction for the design of school grounds: "New landscaping shall be designed to enhance natural features and shall consider:

- The use of native plant species
- Maximizing biodiversity
- Providing year-round interest
- A mix of deciduous and coniferous species

- Protection from wind and sun exposure
- Buffering between vehicular and pedestrian areas
- Creating pleasant and interesting outdoor spaces for human use
- Minimizing maintenance requirements

[In addition, landscape designs are to use plantings] to offer shelter and shade, filter dust and noise, and provide varied habitats and green corridors."

Chapter 2

PROCESS

There are various steps involved in a greening project and many ways in which a maintenance or operations department might assist in guiding the process.

PLANNING

Whatever form the greening project process takes, all successful examples seem to benefit from the following:

- A clear, well-articulated statement of the purpose of the project
- Early involvement of the maintenance or operations department
- Discussion and approval in principle of the preliminary concept and site location before any detailed design takes place
- Demonstration of a substantial commitment by the school and by all levels of the board
- Shared ownership of the project by the school and the board
- Extensive consultation with all affected stakeholders

Good planning is the key to a successful project. While it will often be the responsibility of the school to plan the project, grounds and maintenance staff can assist inexperienced groups by suggesting a logical sequence of steps. The proponent should be encouraged to contact the maintenance department early in the process to determine approval requirements and identify key issues.

If a greening project is to be successful it requires broad support from all levels of the school community (principals, teachers, custodians, students and both the operations and the planning departments of the school board). The formation of a greening committee is a critical step in the planning process. This committee should develop clear goals for the project and articulate the educational and environmental rationales for the project.

A good design will fit into the existing context of the site. Grounds managers should encourage the greening committee to extensively analyze existing site conditions. They can also provide a site inventory checklist (see Illustration 1) to ensure that everything is considered. On the basis of this analysis, an appropriate site and a design responsive to that site can be selected.

CONSULTATION

The proponent should be encouraged to consult with stakeholders from the school and the wider community to ensure that all needs and concerns are addressed at an early stage. The consultation might be orchestrated by a hired consultant (such as a landscape architect or designer) or a volunteer member of the greening committee but is probably best done by school board staff familiar with other staff and departments. Local sensitivities will dictate the number of consultations and the form they take. A consultation list should include the following stakeholders:

- Facilities planning department
- Operations department
- School custodian

- Teachers
- Students
- Parents
- Neighbours (especially those who can see the site)
- Local municipality if use of the site is shared

APPROVAL IN PRINCIPLE

Before the greening committee proceeds to the detailed design stage, it may be appropriate to approve the location and broad aims of the project. Some school districts require signed authorization at this stage but most require only that the proponent obtain verbal approval from the maintenance department.

Ask This!

- *Will naturalization and play extensions be affected by future expansion of the facilities?*
 - *Do school ground changes allow for utility/access corridors?*
 - *Do landscape enhancements make sense in terms of crime/vandalism prevention?*
 - *Does the design integrate and respect diverse uses?*
 - *Is the project driven by educational goals?*
 - *Does the project serve the physical, emotional and intellectual needs of the child?*
-

The Toronto District School Board had hired a number of landscape architects to act as facilitators in the development of master plans for schools, which included natural outdoor classrooms. This was a result of the wholesale removal of play ground equipment from many schools due to the equipment's failure to meet CSA standards and the need to replace interactive play and educational elements.

DETAILED DESIGN

Once the location and general goals of the project have been approved, detailed design work can begin. Producing a great design for a greening project requires that attention be paid to future uses of the site as well as the existing natural conditions. Design is a complex process of iterative refinement, and for a large project, many designs will likely be produced.

Working with Professionals

Many school greening committees have talented members capable of designing a complex landscape plan. Others, however, may require assistance from an expert in landscape design or landscape architecture, or from a student of those professions. Such professionals are well versed in the practice of creating designs that meet multiple objectives and understand the constraints and opportunities of a site. They should act as facilitators who assist the school and district staff in the creation of a project that meets the goals as set out by the greening committee.

If the project has a significant landscape restoration or naturalization component, the assistance of a naturalist or habitat biologist may be beneficial. These professionals have expertise in re-creating and protecting natural landscapes and understand the subtle interplay of plants and animals in the ecosystem.

EVALUATION AND FINAL APPROVAL

The site inventory and design together with articulated project goals and curriculum linkages make up the *greening plan*. This should be submitted for evaluation and approval. During the evaluation process it should be determined whether the project meets the stated goals, shows a link to school board policy and articulates the principles of outdoor learning. The components should be designed to be durable and complementary to the aesthetics and ecology of the project.

CONSTRUCTION AND INSTALLATION

Once approval has been given, construction and installation of the project can begin. It may be handled by the grounds department, volunteers or a professional contractor. The best approach will involve the school and the grounds department acting in partnership to manage installation. Volunteer planting days will help to ensure that students learn about habitat and native plants and experience caretaking activities, possibly leading to a greater ecological consciousness and an advanced land ethic. Community relationships will also be enhanced and curriculum objectives achieved.

Suggested Contents of an Approval Package

An approval package should clearly state what information the school board requires in order to approve the project. Based on the approval package developed by Rob Illick of the Calgary Board of Education and ideas from other school districts, a package might include the following:

- A brief guide for schools providing an overview of the greening process; policies, procedures and design standards that must be adhered to; suggestions for funding; and information requirements
- A form requesting a project description and rationale; an explanation of how educational objectives will be met by the design and the process (this is key); anticipated scheduling and phasing; a brief project history; and a list of the people consulted and results of the consultations
- A request for a site inventory (this should include a checklist – see Illustration 1)
- A request for a landscape plan drawn to scale and showing the location of existing buildings and access routes; the location of proposed garden components, including paths, benches and ponds; the location of proposed planting areas; and the location and types of plants
- A form requesting the names of greening committee members and their responsibilities
- A request for a letter of support from the principal (other letters of support from teachers, neighbours and students will indicate the level of commitment to the project)
- A request for a maintenance task list and schedule
- A maintenance contract/agreement with the volunteer committee
- A form requesting a budget for the project, including items that will be received in kind
- A request for a sunset agreement just in case the project falls into disrepair

Construction will generally involve several phases of work, including

- project management (organizing deliveries, coordinating volunteers, developing contracts, checking insurance/WCB requirements, and collecting tools and equipment);
- preparation (layout, staking, marking utilities, which is required before digging, arranging for security fencing and lock-up, removing sod or unwanted vegetation and root material, removing concrete or asphalt, stripping and stockpiling topsoil, grading, rototilling, digging, and adding soil and soil amendments such as compost, bone meal and lime);
- construction and installation of garden components (pathways, planter boxes, garbage cans, logs, stumps and fences);
- planting (trees, bushes, bedding plants and seeds) and watering in; and
- cleanup.

A professional contractor should obtain liability insurance, including a rider with the school board included as a named insured. Some school boards require volunteer groups to obtain liability insurance, too.

MAINTENANCE

The final stage of a successful greening project is effective maintenance.

Inadequate ongoing maintenance is the most common reason for the failure of greening projects according to school ground managers. Chapter 5 discusses the key maintenance points of school ground greening projects.

Illustration 1 – Site Inventory Checklist

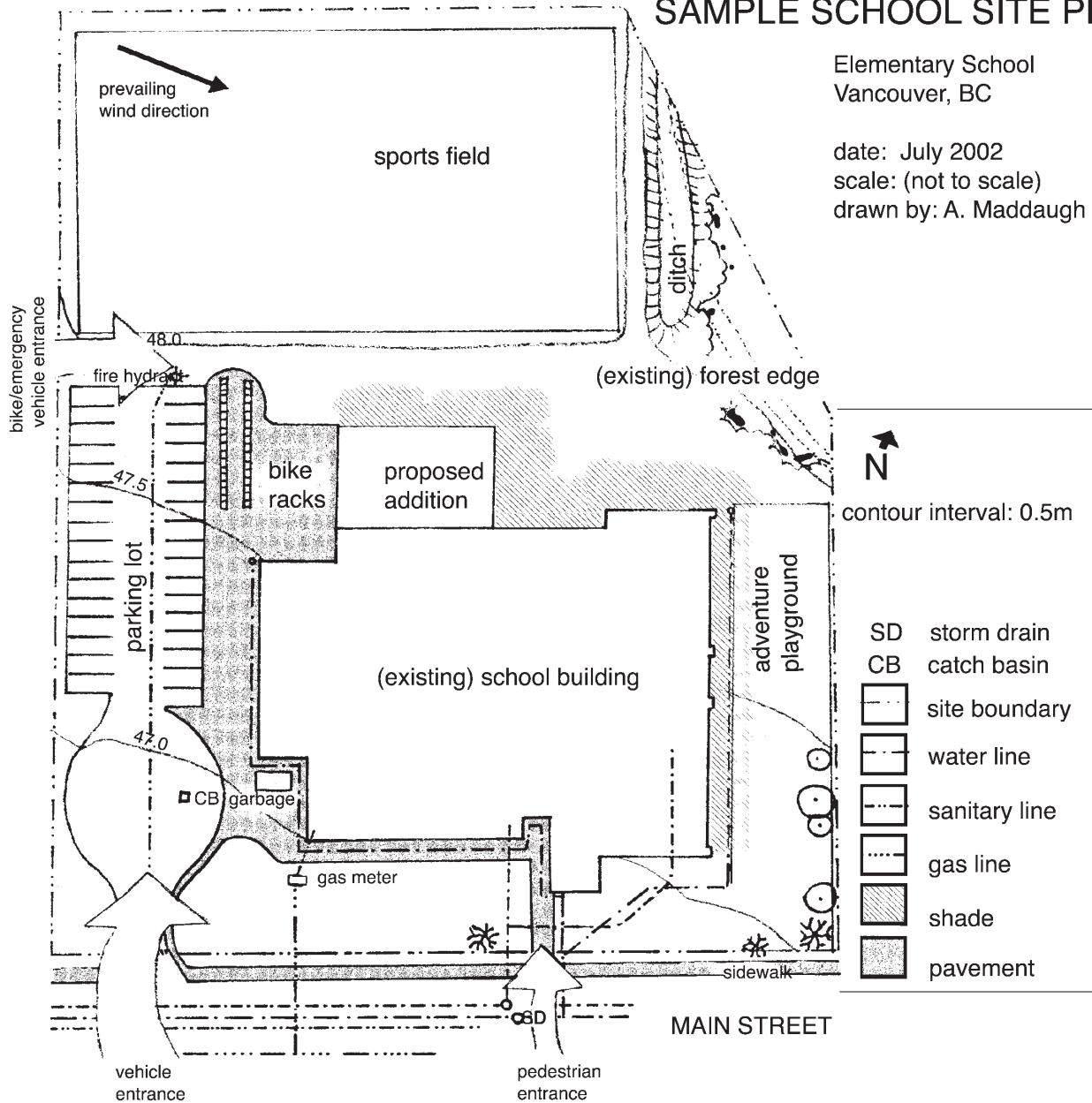
During the planning stage, a scale drawing of the existing site should be produced with the following shown:

- Existing buildings and planned expansions (check with facilities planning department)
- Shade cast at different times of the day by existing and planned buildings
- Prevailing wind direction
- Solar exposure (aspect)
- Existing access points for vehicular and pedestrian traffic
- Existing underground and overground utilities, including electric cables, gas lines, water mains, telephone cables, sewer lines and septic field beds
- Existing swales, ditches, surface drainage routes, downspouts (footing drains) and field drains
- Existing garbage containers and emergency preparedness containers
- Natural site topography
- Current use of the site (at different times of the day)
- Current use of the surrounding area
- Existing plant material and its condition (noting species and whether native, non-native or invasive)
- Soil type, soil pH, potential for contamination, moisture, percolation and organic matter content
- Existing water features (such as ponds, streams and marshes) and the species that live there
- Existing adventure play grounds
- Existing sports pitches
- Existing water supply, including faucets and sprinkler systems
- Existing crime, security and vandalism issues
- Natural and cultural history of the site

SAMPLE SCHOOL SITE PLAN

Elementary School
Vancouver, BC

date: July 2002
scale: (not to scale)
drawn by: A. Maddaugh



SITE DETAILS

Soil type

pH 6.5 / sandy loam (15% clay, 45% sand, 40% silt)

Existing vegetation

School yard trees: 4 x Red Cedar, 3 x Red Alder. Forest edge: Douglas fir, ferns, salal, and salmonberry.

Current uses

Invasive species: Himalayan blackberry (on eastern boundary)
sports field and adventure playground used heavily, in-line skating on west side of school (paved area), forest edge used by one teacher for science class, the ditch is popular in rainy weather (floating boats, etc.), parents gather near trees in NE corner before/after school

Neighbouring uses

strictly residential

Vandalism issues

people use the garbage bin (south side) to climb onto school roof

Water features

none existing, but the ditch fills 4cm during heavy rains

Natural/cultural history

the ditch area was historically a stream bed, the site is on traditional Musqueam territory

Chapter 3

TYPES OF GREENING PROJECTS

The terms *greening* and *naturalization* are used broadly by those involved in the creation of greening projects. Explaining the rationale, the challenges and the opportunities associated with various project types will be helpful to those managing school ground change.

Children crave different educational input at different stages of their lives. If school grounds are to contribute meaningfully to child development, they must be designed with the educational needs of children in mind. As Stine (1997) explains, “Learning grounds should have accessible and inaccessible areas; places for passive and active play; elements that are risky and others that are repetitive and secure; hard and soft surfaces; and natural and built elements.”

That means designing landscapes that incorporate diverse opportunities to play, observe nature, test theories and apply classroom knowledge. It means using surfaces and textures that are less likely to cause injury, that feel safer and less hostile and that develop tactile sensitivity. Finally, it means creating opportunities to work together in a cooperative environment and develop physically.

From the creation of natural habitats to the installation of weather monitoring systems, greening projects can take many forms. Broadly, they can be separated into four main categories: (1) habitat restoration and naturalization projects; (2) theme gardens; (3) spaces for active play; and (4) landscapes to enhance stormwater management. The best projects integrate these approaches to create landscapes of great diversity that cater to the whole spectrum of children’s play and learning needs.

HABITAT RESTORATION AND NATURALIZATION PROJECTS

This type of project mimics as far as possible the natural features and functions of the local ecosystem. Habitat can generally be broken down into the following categories:

- Food and water sources
- Refuge areas
- Nesting areas

Habitat areas that provide food and water sources can take the form of plantings, ponds, shallow pools or creeks. These elements offer the highest habitat value both educationally and environmentally. While some schools enclose ponds with fences

At Grandview?uuqinak’uuh Elementary...the children now have a diverse natural area in which to play. They spread themselves throughout the entire school grounds and this has decreased the incidence of violence considerably compared to earlier levels.

Sam Filipoff in BC School Ground Coalition, 2001



or courtyards, others have taken safety precautions that still allow easy access. Protected waters, where tadpoles and other water-borne organisms might live, are excellent habitats and are relatively easy to build and maintain. Creating refuge and nesting areas is easy. Hedges, dense plantings and even something as simple as a plank of wood on the ground in a moist site can provide places where birds, small mammals or even salamanders can find safety and nurture their young.

Selecting Plants

Based on the premise that plantings should reflect the local ecology, plants should primarily be chosen from native plant lists for the area. Native plants are specifically adapted to local soil and climate conditions. Ferns, for example, thrive in moist, rich soils in temperate areas while short grass species do well in the rigours of the Prairies. However, not all native plants will survive in urban conditions. Sometimes it is necessary to include introduced species or varieties of native plants that will grow well and provide children with an enhanced understanding of their botanical surroundings.

By selecting native plants for our school grounds, we link the schools with the landscape of the region preserving and reinforcing the region's ecosystem.

Maryland State Department of Education, 1999

Climate

Canada is categorized by climate type into a number of plant hardiness zones. These zones – recognized by horticulturists – are used to determine what plants will survive in Canada's different regions. One of the basic criteria to apply when selecting plants is the plant hardiness test. Plants to be used should not just survive but should thrive in the school ground environment.

Soil

Often soil is imported when a building is constructed. It may be compacted or contaminated. Laboratories that specialize in soil analysis can determine the type of soil and its nutrient content, screen for contaminants and recommend amendments. Organic soil amendments should be requested if the use of chemicals is to be avoided.

Moisture

Climate and soil type will determine the level of moisture available for plants on the site. A wet, boggy or poorly drained area will not support plants native to sandy, loose soils. An evaluation of the soil moisture regime and fluctuations should be done prior to the selection of plant materials.

For Further Advice

Organizations to call for advice on plant selection include provincial nursery trade associations, provincial landscape architecture associations, professional biologists associations and local naturalist groups. For additional resources, visit www.evergreen.ca.

Educational Rationale

Natural areas are integral to the formal and informal learning experiences of children. Direct, “in the field” experience of plants, birds and insects adds to the depth of a child’s environmental understanding. The cognitive and experiential world a child comes to know is significantly enhanced if his or her environment includes “wild” places. Habitat areas increase students’ knowledge of their bioregion, the unique ecological and social characteristics of the places they call home. Habitat areas provide opportunities for students to take active stewardship and leadership roles in addressing global environmental issues, such as local loss of habitat, in tangible, positive ways.

Environmental Rationale

Most creatures have adapted to unique habitats that meet their need for shelter, food and breeding areas, which, in turn, leads to their long-term survival. All species of animals and plants are dependent to some extent on other species and their habitats for survival. The unique web of interconnected relationships among animals, plants and the non-living landscape is called an *ecosystem*. When wildlife habitat in urban places is severely degraded these bonds are stressed or broken. Efforts to regenerate habitat in school yards can contribute to revitalizing the health of the ecosystem, especially if they are linked to a wider community habitat enhancement strategy.

Naturalized landscapes can help reduce airborne particulates and mitigate sound and water pollution. They can also enhance the management of stormwater by providing pervious surfaces and tree cover that enhances the infiltration of rainwater and adds nutrients for water-borne insects.

Considerations

The basic components of an ecosystem, including soil type, hydrology, plant combinations, and insect, bird and animal species, will guide the design of any naturalization project. Replicating the natural ecosystem by selecting plant combinations that occur naturally in the landscape is an underlying naturalization principle. That said, there are sometimes constraints within an urban environment that mean choosing certain kinds of habitats over others. For instance, creating bird habitat with hedges, linear plantings and berry-producing plants may be more desirable than creating habitat that supports small mammals. Maximizing ecosystem contributions (food, shelter and breeding grounds) regardless of habitat type is essential. It should be remembered that harvesting plants from the wild is not appropriate. However, interesting salvage or plant rescue opportunities may arise.

In one greening project, a Calgary maintenance department managed to save and relocate areas of habitat that were due to be destroyed by the construction of an oil pipeline. The habitat was dug up in large chunks and transported on trucks to

Several U.S. agencies have conducted cost comparisons of naturalized versus conventional landscapes. These studies have shown that naturalized landscapes can offer overall maintenance cost savings of 80 to 90 percent over a 10-year period. They also offer cost reductions of between 10 and 50 percent on a building's heating and cooling costs.

Evergreen, 2001

the school site, where it was incorporated into the greening project. This example of a creative, cost-efficient connection was a result of a maintenance department working in support of a greening initiative.

Further key considerations include:

- encouraging natural seeding and succession of the ecosystem by reducing disturbances;
- engaging in selective weeding of invasive or aggressive species only; and
- promoting connections to other natural areas.

Requirements

It is advisable to secure advice from a local naturalist or habitat biologist when designing a project. Other common requirements include

- careful project placement (plantings located near an existing wild area such as a ravine, for example, are the most beneficial); and
- new plantings over time (this is important if no natural seed sources exist nearby).

Maintenance Recommendations

Other than litter cleanups and additional plantings to increase diversity, little work is required to maintain naturalization projects once they are established. Considerations include

- using a 15-centimetre-deep layer of wood chip mulch to reduce weed growth;
- planning to water in the first one to two years or until plants are established;
- replacing plants that do not survive on their own after the initial watering period; and
- accepting that the aesthetic of a naturalization project is less “tidy” than that of non-native plantings (interpretive signage will help to communicate the purpose of the project and reduce conflict over its aesthetic).

Ask This!

- *Will the habitat area fit the local and regional context?*
 - *Will the habitat area enhance the ecology of the school ground and the neighbourhood?*
 - *Will the habitat area incorporate outdoor classroom components?*
 - *How can the benefit of habitat areas be formalized in local board or district policy?*
-

Habitat Restoration and Naturalization Projects

Type of Project	Characteristics	Educational Benefits	Environmental Benefits	Plant, Site and Design Considerations	Maintenance Considerations
<i>Meadows/ Prairies</i>	Native grasses and wildflowers	Seed and plant propagation; observation of wildlife in open area	Reduced chemical use and maintenance; attraction of birds, butterflies and animal life	Soil preparation; use of native wildflower mixes; use of planned trails/pathways to prevent damage to habitat	Importance of not mowing or adding fertilizers or compost, as nitrogen is unwanted; manual weeding to remove unwanted species in early stages
<i>Forests</i>	Native trees and understorey	Knowledge of urban forests and climate change; place of refuge; opportunity to build friendships based on shared discoveries	Shelter for a wide variety of wildlife; shade and cooling; erosion protection and slope stability	Importance of rich soil; protection of saplings; planting in clumps to mimic wild patterns; creation of forest layers of ground cover, understorey and canopy plants	Addition of organic matter to soil; use of mulch to control weed growth and reduce irrigation requirements; control of invasive species
<i>Wetlands</i>	Swamps, bogs, ponds and aquatic plants	Understanding of role of wetlands in supporting bird migration; observation of amphibious and aquatic life	Creation of threatened ecosystem; rich habitat for abundant species; storage and filtration of stormwater	Careful selection of plants that will thrive in local conditions; creation of shelter at edge of pond for merging wildlife	Removal every few years of sediment and accumulated plant debris from constructed wetland; maintenance of inlet and outlet elevations as designed
<i>Refuge Areas</i>	Thickets of shrubs, hedgerows, boulder piles, buried drain pipes, hollow logs and snags	Observation of species' camouflage strategies and predator/prey relationships; opportunities to observe species' habitat use over time	Creation of place for wildlife to shelter and rest	Working with naturalists and biologists to plant the right mix, number and size of plants to attract target species	Secure installation of all elements so that vandals cannot move them; replanting, pruning and/or removal of plant material depending on extent of use
<i>Nesting Areas</i>	Bird boxes and hollowed sections of snags	Increased understanding of breeding patterns, habits, needs of local wildlife species	Creation of place to breed and raise young	Determination of and provision for species most likely to thrive	Preparation of nesting boxes and other habitats well before breeding season

Pocket-Sized Farms (a food-security project run by LIFESPIN, an Ontario non-profit organization) has developed several food-related school garden projects in London, Ontario. These gardens are used to teach organic food production and nutrition and to supplement the food supply of low-income families.

Exemplary play environments must address the development of the whole child to ensure their physical, emotional and psychological well-being. To do this, all of their needs...must be addressed in a rich, stimulating, safe and diverse play environment that encourages individual and group expression.

Toronto District School Board, 2000

THEME GARDENS

Theme gardens are intentional creations of plants and structures modeled on a particular topic or theme. They are designed to maximize study and learning opportunities for children and therefore should include interpretive elements and components that encourage active participation, observation and quiet reflection.

Educational Rationale

Alexander (1995) has shown that school gardening can enhance the academic performance and general well-being of students, improve relationships with parents and other adults, and assist in the development of a respect for living things. Academic performance is often enhanced through stewardship activities and the use of nature as a framework for learning in all areas. Gardens stimulate the imagination and enhance understanding of food sources and food security as well as ecosystem relationships.

Environmental Rationale

As they are not typically modeled on the profile of a natural ecosystem, theme gardens may have fewer direct environmental benefits than naturalization projects. Still, projects based on a theme can increase biodiversity in otherwise sterile landscapes, enhance habitat value and provide additional storage/filtration of groundwater. Larger-scale tree plantings can contribute to better air quality.

Considerations

Theme gardens can be developed in areas of any size. This flexibility is an important consideration in the creation of the original design.



Theme Gardens

Type of Garden	Characteristics	Educational Benefits	Environmental Benefits	Plant, Site and Design Considerations	Maintenance Considerations
<i>Native Wildflower/ Butterfly Gardens</i>	Grasses and perennials that attract birds and butterflies	Opportunity to share seeds with wider community	Provision of habitat for migrating butterflies; attraction of wildlife; reduced pesticide use	Increased use of native species; importance of sun	Additional watering in first year; use of bed of sand to reduce weeds (invasive species); weekly weeding for first two years; revised program of weed control thereafter
<i>Food Gardens</i>	Raised beds, rich soil built with compost and well-defined pathways	Knowledge of food production, food preparation and nutrition; improvement of quality and quantity of food available to low-income households; understanding of impact of transporting food from afar; study of organic vs. conventional growing methods	Absence of chemical fertilizers and pesticides; focus on building health of soil and attracting beneficial species of insects, birds and reptiles to control pests	Use of raised beds; importance of rich, fertile soil improved with compost; organic food production techniques; closeness to water source; location of site in full sun, when possible, and within view to discourage theft and vandalism	Ground preparation in spring; regular weeding; protection of young plants; watering
<i>Multicultural Gardens</i>	Collections of plants predominantly used by other cultures	Knowledge of other cultures; understanding of impact of bringing food from afar as opposed to growing it nearby	As above, depending on species selected and design	Need for sun, shade and water	As above, depending on species selected and design
<i>Heritage Vegetable and Flower Gardens</i>	Crops grown by our ancestors, with minimal adaptation by humans. (Rare now since modern agriculture has selected only a handful of crops to modify and grow)	Exploration of seeds that may become extinct; study of biodiversity	Protection of biodiversity; diversity of seed stock for future generations	Working with heritage seed and species groups to promote non-hybrid plantings	Harvesting and saving of seeds
<i>Herb Gardens</i>	Plants that are used in cooking, medicine and dyeing	Knowledge of herbs; enriched garden experience due to fragrance of herbs	Attraction of insects and bird species	Potential for some herbs, such as mint, to become invasive	Annual and biennial pruning and/or removal or replacement of herb plantings
<i>Pond and Bog Gardens</i>	Wet areas with collections of aquatic plants and other organisms	Opportunity to observe and record; appropriateness for class projects	Rich source of food for many species; excellent breeding habitat; response to disappearing wetlands in urban areas	Need for extensive preparation; difficulty of finding and establishing wetland plants; importance of strategies to improve safety of standing water	Level of work needed to establish plants; susceptibility to vandalism/garbage dumping
<i>Planter Box Gardens</i>	Herbs, salad crops and flowers	Easy access; opportunity to observe; adaptability to needs of disabled students		Suitability of plants that require less water and fewer nutrients; need for good drainage in planters	Need for frequent watering and feeding; spring planting and fall cleanup of annual plants

Adapted from **Transforming the Schoolyard: How Local School Communities Design and Build Their Playground Learning Environments**
Toronto District School Board, 2000

Play spaces that are rich in diversity act as a beacon for the community. They draw in children of all ages, parents, grandparents and caregivers to experience the joys and wonders of play. These rare spaces should be celebrated and, more importantly, replicated.

Kim Sanderson in Graham, 1999

Requirements

It is essential to be clear about the purpose of a theme garden and what it is meant to teach. Design elements need to be incorporated that address learning opportunities, preferably for multiple age groups.

Maintenance Recommendations

As these spaces are often well used, it is important to repair damage to plants and components quickly so that the spaces do not become abandoned or neglected.

SPACES FOR ACTIVE PLAY

Greening projects are not only about creating habitat and learning gardens. They can also incorporate spaces that support creative, active play. Such projects focus on the experiential learning and physical play qualities of natural outdoor spaces and materials.

Educational Rationale

Active play areas focus on social interaction. They encourage children to become familiar with natural surfaces and objects and provide innovative teaching environments that take learning out of the classroom and put it into the school yard. Raffan (2000) reports that the diverse play opportunities represented by naturalized spaces can aid language development as well as physical development.

Where children play affects how they play. Their natural curiosity and desire to explore can be blunted by static surroundings. Yet almost any play space can be transformed into a cornucopia of play opportunities and experiences.

Graham 1999

Environmental Rationale

Active play spaces incorporate many of the components of naturalization projects but are generally built on a smaller scale. By focusing activity on areas designed for intense use, these areas direct activity away from more sensitive naturalized areas.

Considerations

A wide range of items can be considered for use in an active play space, including hardy shrubs, trees, wide pathways, seating, amphitheatres, movable pieces, mounds and slopes.

Requirements

Active play spaces require areas in which to run, climb, hide and experiment with textures and shapes. Components must accommodate high-intensity use. They may also help to protect plants; for example, raised beds and edging. Chapter 4 provides more on landscape components.

Maintenance Recommendations

Mulching with wood chips, and topping up on a regular basis, is recommended to prevent compaction.

LANDSCAPES FOR STORMWATER MANAGEMENT

The impact of urban development on aquatic ecosystems (especially streams) can be significant and generally can be grouped into four categories: (1) changes to hydrology; (2) changes to form; (3) reduced water quality; and (4) changes to aquatic ecology. Properly designed stormwater management systems that use plants, soils and ponds to store, cool and filter stormwater, thereby delaying the movement of stormwater to nearby streams without increasing flood risks, may lead to the alleviation of many of these impacts.

The [rain garden] transformed an interior grassed courtyard into a beautifully landscaped storm-water treatment system that slows down, filters, and removes pollutants from runoff before [it enters] the bay.

Maryland State Department of Education, 1999

Educational Rationale

Natural stormwater management systems can be used to teach students about the hydrologic cycle, the importance of protecting water quality, the role of naturalized landscapes in storing and filtering stormwater and the cause and prevention of flooding.

Environmental Rationale

When rain falls on school landscapes that are mostly large areas of asphalt, it may rush quickly, untreated, into the municipal sewer system and out into the nearest receiving natural body of water, such as a lake, river or ocean. Increasing the permeability of surfaces and installing systems that use plant material to filter stormwater can have a beneficial effect on local water quality and, in combination with other initiatives, on regional water quality as well.

Landscapes for Stormwater Management

Stormwater Management System	Characteristics	Educational Benefits	Environmental Benefits	Plant, Site and Design Considerations	Maintenance Considerations
Swales	Shallow depressions	Understanding of stormwater management in urban realm and importance of groundwater replenishment	Infiltration (recharge) of groundwater; prevention of erosion and sewage overflow caused by peak flows of stormwater into stream beds/combined sewer systems	Use of marshy plantings and/or grass	Keeping swales shallow to allow easy mowing and trimming
Dissipation Areas	Low-lying areas that receive stormwater and allow infiltration into the ground			Use of sand or gravel base to enhance permeability; special consideration for clay areas	Raking of sand
Streams	Natural stream beds with complex geometry of riffles, pools and meanders	Knowledge of complex mechanics and aquatic ecology of streams	Superior dissipation of the energy of high flows of stormwater	Soil and engineering requirements	Cleanout of debris catchment areas; monitoring of stream bank stability

Considerations

Any stormwater management system must be able to handle large volumes of water. That means that overland flow routes must be protected. Biofiltration systems that collect and filter water from parking lots, roads and roofs can be created. Plants that are known to effectively filter out impurities from water should be chosen for these systems.

Many stormwater management systems, if properly designed, can add significant play value. One outstanding example is Grandview?uuqinak'uuh Elementary's dissipation pond, which is experienced by the students as one very large sandbox. This area has become among the most used play spaces at school.



Requirements

While they offer exceptional educational and environmental benefits, stormwater systems are complex. Improperly managed stormwater has the potential to cause flooding, property damage and the environmental impacts noted above. Input from an engineer or landscape architect is required for any changes to a system. When considering a stormwater management system, testing of the local soil for suitability is necessary. Sandy soils are preferable as they absorb water quickly.

Maintenance Recommendations

It is important to make sure that catchment areas are kept free of debris.

INTEGRATED DESIGNS

The previously noted categories of gardens are most often not used in isolation. These approaches to greening can be combined in a larger project to deliver the best of both enhanced learning opportunities and environmental improvement. The Grandview?uuqinak'uuh Elementary project, illustrated on the following page, is an excellent example of how multiple approaches to greening can be combined in one landscape.

CASE STUDIES

CASE STUDY #1

Grandview?uuqinak'uuh Elementary

The greening project at Grandview?uuqinak'uuh Elementary in Vancouver, British Columbia, is one of the most ambitious in the country. It combines multiple components, including a dissipation pond and a swale that enhance stormwater infiltration; a First Nations longhouse for celebrations and gatherings; a butterfly garden; a community vegetable and herb garden; and an ethnobotanical garden. These different elements form a landscape that offers diverse learning opportunities.

Leveraging Volunteer Contributions

Many components were built, installed, maintained, and/or fundraised for through volunteer efforts. The planters, benches, shed, tools, paths, fencing and fruit trees in the Community Garden section were all provided by volunteers, while the design for the longhouse was provided in-kind by a local architecture firm.

CASE STUDY #2

Maurice Cody Public School

The greening project at Maurice Cody in Toronto, Ontario, is diverse and includes a spiral pattern that leads the user past several theme gardens on the way to an outdoor classroom. Perennials and grasses are complemented by woodland edges in various parts of the outdoor classroom project.

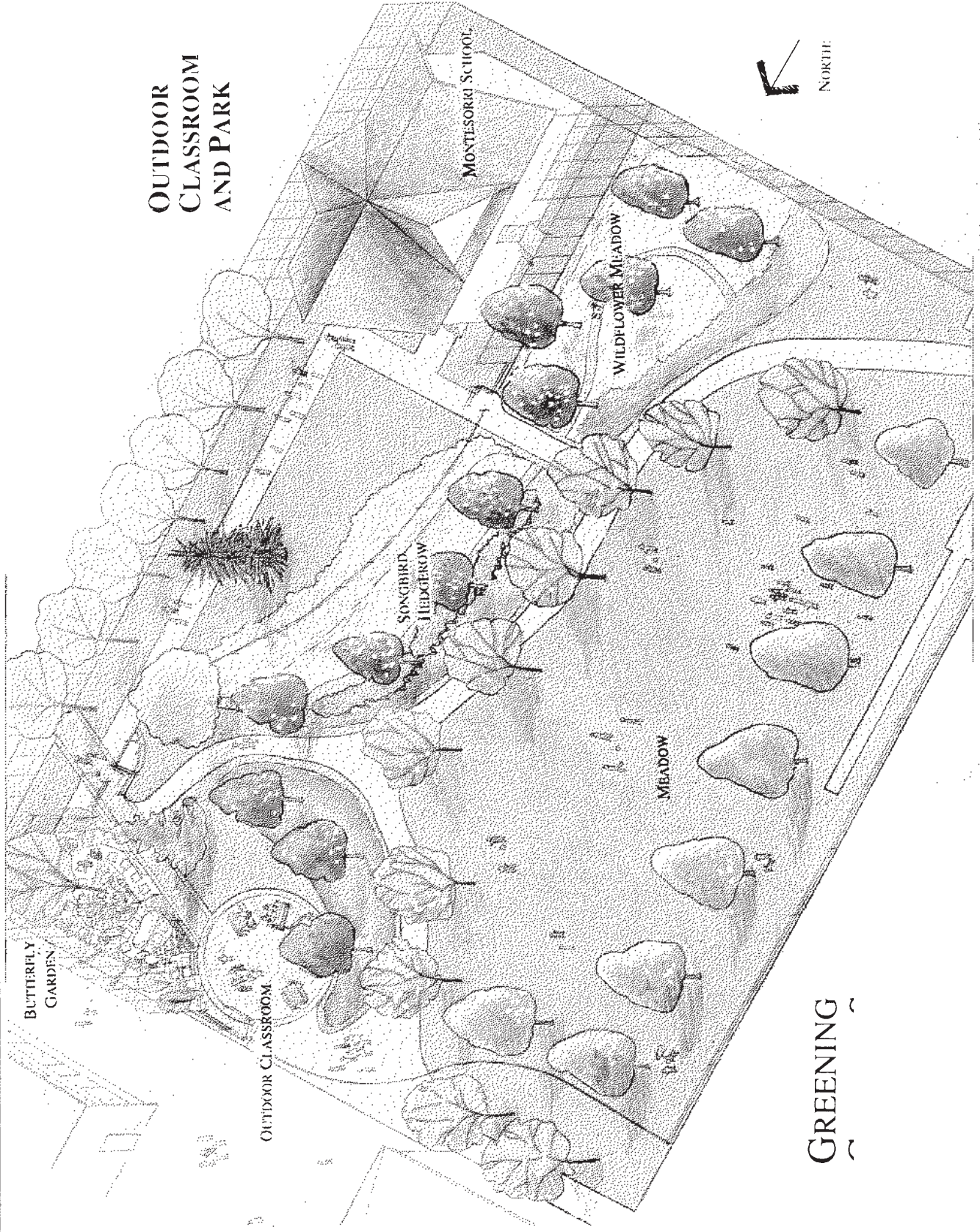
Community Support for Maurice Cody Public School Project

Going strong since 1996, Maurice Cody's Discovery Garden was created through financial (cash and in-kind) assistance provided by community members, non-profit organizations, the school committee and school board staff.

OUTDOOR CLASSROOM AND PARK



NORTH



GREENING

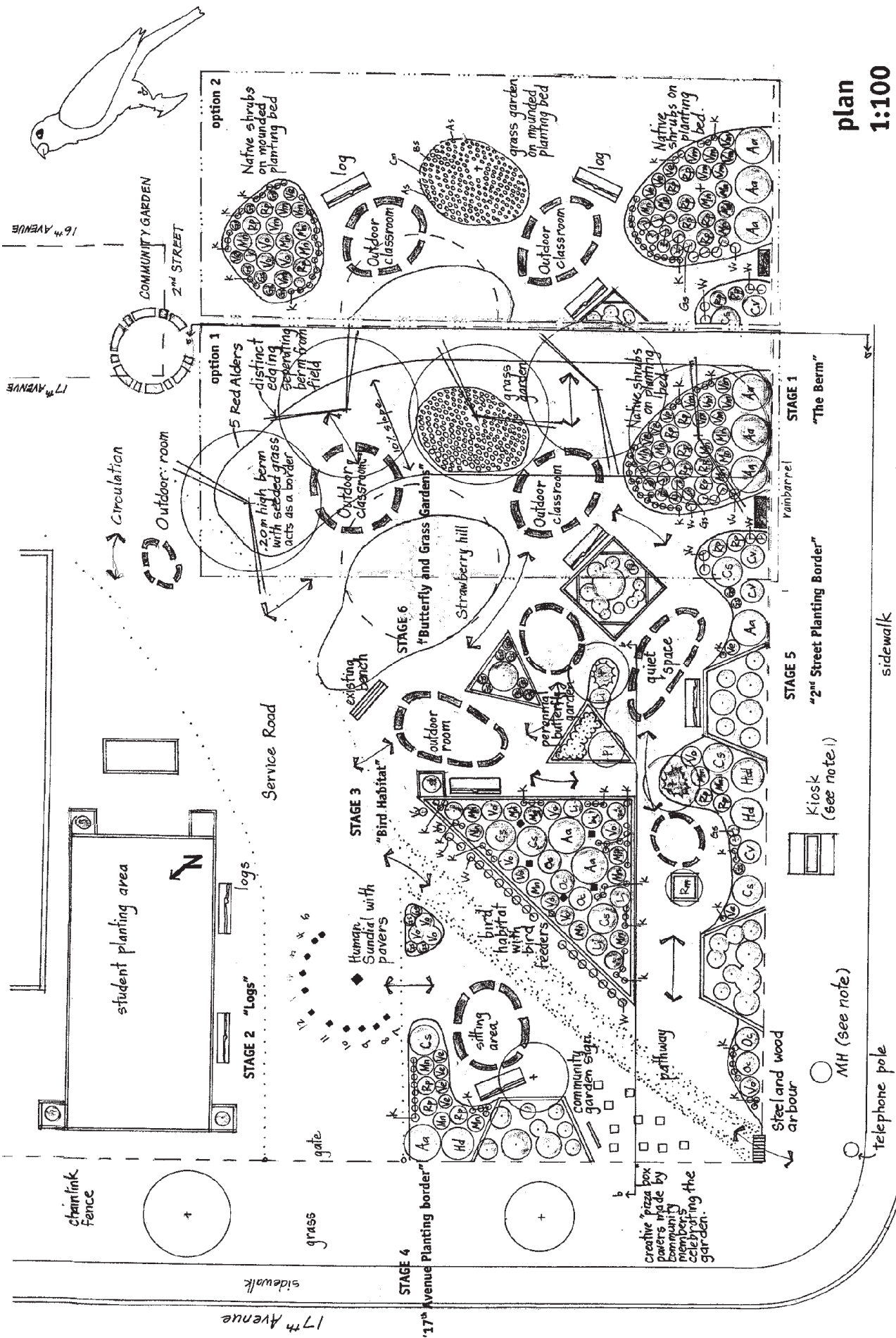
CASE STUDY #3

General Gordon Elementary

The General Gordon Elementary greening project in Vancouver, British Columbia includes a butterfly garden, trees, and willow weavings and restoration plantings on a wet part of the site. Specially selected plantings of native flowers and perennials are designed to attract butterflies.

Schools Contribute Financially through Volunteer Stewardship Activities

While this project came in at approximately \$30,000 (2001), this did not include the 800-1000 hours of volunteer time provided in-kind by over 200 volunteers for maintenance activities such as watering, mulching, weeding, pruning and minor plant replacement.



plan
1:100

CASE STUDY #4

Second Street Community School

The Second Street Community School greening project in Burnaby, British Columbia, features several native planting areas, including one dedicated to bird habitat complete with bird feeders. There is a perennial butterfly garden and a number of seating areas that support outdoor learning. Second Street Community School also has various active play features and planter boxes, a berm, and signage that interprets the ecological processes at the site.

Supporting the Second Street Community School Project

As with the other three projects, an overwhelming part of the project financing has come through volunteer contributions. At Second Street, volunteer hours alone total \$37,700 over a two year period, from 1999 to 2001.

Chapter 4

LANDSCAPE COMPONENTS

Landscape components, the non-living infrastructure, should be chosen carefully to fit with the intent of the greening project. They should work with the site, help to create a sense of place and respond to the social and educational needs of students. In this sense, it is important to use the ecological and biophysical characteristics of the area in the design of infrastructure as much as possible. It is also important to balance the perceived risks and educational benefits of certain components.

Further considerations to explore include whether components should be designed by a professional (architect or engineer) or whether they can be designed by a greening committee member. Some consideration might be given as to whether components can be repaired or replaced with local materials.



Benches

High-quality, durable benches can be very expensive. Imaginative approaches to bench construction can be economical and better serve students' learning and play needs. Consider

- slabs of stone built into a berm or slope (stone surfaces can be split, cut or ground flat);
- benches built into larger planter boxes or around trees;
- benches constructed of cast concrete; or
- benches built with smooth wood logs.

SEATING COMPONENTS

Every greening project should include places for children to sit, socialize and learn. Well-designed components can significantly enhance the range and type of educational experiences teachers offer their students. Moving a class outdoors allows for proximity to specific subject matter and alternate places for social interaction. If the lesson is to be taught in one location, landscape components such as seating become imperative for comfort and to sustain the students' attention. Seating also offers places for quiet study and reflection.

Components should be durable and replaceable. They should also be scaled to the height of the schoolchildren and be smooth and splinter-free. Movable seating may be desirable. In that case, an assessment of whether it might pose a problem, and suggestions on how to address the problem, should be made. Including both group and solitary seating in areas of sun and shade are other considerations. Sun and shade options allow students and teachers to take advantage of different weather patterns and times of the day and year.

CONTAINERS FOR PLANTS

A well-prepared, well-defined planting bed with good-quality soil is the ideal environment for plantings. However, planting containers can be effective, too, as long as they are integrated with other elements in a greening project. Raised beds are ideal for vegetable gardening as they help to define the growing area and hence deter trampling. And planters can be made accessible to wheelchair users, ensuring that all students have access to the garden.

It is important to remember that container-grown plants will likely not live to their natural maturity. They may be susceptible to disease and insects and will likely require more water than plantings grown directly in the ground. The following will offset the stresses of growing plants in containers:

- Adequate soil volumes (surface areas should be no less than 1.5 square metres, and depths no less than 0.85 metres)
- Adequate drainage (ideally, the bottom of the container should be entirely open and in full contact with loosened, well-drained native soil)
- A rich, well-drained soil mix (unaltered native soil should not be used as compaction, drought and nutrient deficiencies may result)
- Containers built of durable materials, especially if they are to be moved (if they are made of wood, the corners must be reinforced; the interiors should be cross-tied for added strength; the minimum thickness of the wood should be 50 mm; and wood preservatives must be non-toxic to plants and humans – hemlock and cedar are preferable to treated lumber, which some districts have banned)



FENCES

Perimeter and barrier structures can be a problem for facilities and grounds personnel in almost every part of Canada. In order to minimize maintenance costs, chain-link fencing is often used. It has become the signature element of many institutional landscapes and as such is not in keeping with the primary objectives of the school greening program: to create safe, ecologically sound landscapes that do not feel “institutional” but are instead unique learning places that signal a caring environment, not a punitive one. In addition, fences sometimes create a

division between what is outside and what is inside. There are ways, however, to make fences that invite entry while still marking a border. In the event that a metal fence is necessary, alternatives to chain link are available, or methods to minimize its “penitentiary” feel can be employed.

Chain link can be “greened” with hardy vines planted at the base of the fence. Over time, the plants will create a green wall. Chain link can also be transformed with a variety of spray-painting and silhouette techniques that are both fun and beautiful. Another option is to use expanded metal lath fencing, or stamped metal, available in a variety of different opening sizes and shapes.

Wood can add character and a unique identity to a project and can even reflect the nature or flavour of particular places. It need not be installed as a solid material. Wooden poles, appropriately sized, can be used for rail fences that double as seating and climbing structures. Sturdy wood pickets, with protecting cap pieces, can be attractive, durable and vandal-resistant.

Live fencing is an ancient alternative to built fencing. Closely spaced plants such as willows are woven together when young. As they grow, an impenetrable barrier is created that requires occasional clipping. These types of barriers are not only effective but provide a green wall.



MOVABLE PIECES

Movable elements add a degree of spontaneity to play and learning that few other elements provide. They are important to the social, physical and cognitive development of children and have been shown to contribute to “communitarian” values later in life. The ability to manipulate their personal environment and fashion it to their unique sense of scale and feel can contribute to children’s understanding of their place in the world.

However, movable elements can present a challenge for maintenance and school district staff. Vandalism, blocked access and potential injuries are only a few of the concerns typically raised. Addressing these concerns through appropriate design and construction is the responsibility of designers, parent groups and school staff. Elements should be durable and heavy enough that they cannot be thrown but light enough and shaped in such a way that they can be pushed, rolled or stacked. They should be contained in an area that is surfaced to allow for their safe manipulation. Movable elements can include logs, rollable stones and concrete blocks with hollow or Styrofoam cores.



INTERPRETIVE ELEMENTS

Interpretive components add to the utility of a greening project by linking curriculum and self-exploration. As well, they capture the interest, attention and support of adult learners and become a community education tool. They can explain the workings of complex systems and offer opportunities to tell stories of place – essential to the success of all greening projects. Interpretive elements communicate to the community the intent of projects and can help to secure further support for ecological landscapes. Examples of interpretive tools and techniques include

- curricula signage, display panels and other signage with photos, text and illustrations;
- kinetic devices;
- learning stations linked directly to a curriculum objective;
- planting themes that demonstrate relationships among different organisms; and
- weather stations that include rain gauges, tipping rain collectors, water weirs and wind speed chimers.



WATER ELEMENTS

Water components in school greening projects create vital environmental and educational tools. They can also be challenging elements to design and maintain.

Water enhances the capacity of a landscape to more fully encompass the range of plant and animal species that colonize an area and adds to the visual and auditory environment in ways that no other element can. Water elements offer opportunities to teach the hydrologic cycle and the critical role of water in human existence and the survival of plants and animals.

But introducing water into a project can generate safety, and sometimes even engineering, concerns. Strategies for increasing the safety of ponds include creating a shallow shelf for the pond, creating dense barrier plantings of aquatic plants around the pond edge and lining the pond with large boulders so that deep sections are too small to fall into but deeper water habitat is maintained. When it comes to introducing stormwater elements, it must be remembered that while

Social studies classes mapped wetlands all over the world and learned the economic and geographical implications and importance of wetlands. In English class, students used what they learned to write a grant to the Chesapeake Bay Trust and letters to local businesses requesting contributions [to the development of their own school ground wetland].

Bohemia Manor Middle School, Cecil County, Maryland in Maryland State Department of Education, 1999.

some of the stipulations surrounding stormwater engineering are formalized, many are the result of practice and few have clear origins. It is important for managers to critically review their policies and determine which are regulatory and which are discretionary so as to effectively blend the operational needs and educational values of water in the landscape.

Shallow wetlands, swales, streams and ponds are examples of water elements that might be included in a greening project. The ecological capacity of these elements can be enhanced by dense plantings at water's edge, while the educational value can be enhanced by boardwalks and interpretive signage.

Water elements should be designed with the following considerations in mind:

- Synchronization with existing grades and stormwater piping
- Specific habitat and learning objectives
- Proper design and utilization of appropriate expertise
- Safety concerns



Ask This!

- *Have all possibilities to include water in the project been explored?*
- *Are the environmental and educational objectives clear?*
- *Has the water element been engineered to site conditions?*

PATHWAYS AND SURFACES

Finding the best material for pathways and surfaces is crucial for both the school greening project and maintenance. A variety of different pathway types are available. Their relative advantages are shown in the following table.

Pathways and Surfaces

Type of Surface	Ease of Maintenance	Appearance	Comments
Gravel	Tends to move in heavily used areas	Can appear very bright in sunny locations	Is readily attained and inexpensive
Bark Mulch	Needs to be replenished; can get muddy; needs well-drained sub-base; can cause splinters	Comes in earth tones and looks natural	Is a soft surface and sometimes migrates to buildings
Asphalt	Is least costly of most surfaces to maintain	Is not attractive in large masses	Is not pervious and needs proper installation
Paving Stones	Are easy to maintain and remove/replace	Offer many creative options in pattern and colour	Can be pervious and are easy for volunteers to help install
Concrete	Is permanent and low maintenance	Can be imprinted, textured and coloured	Is an impervious surface and requires a capable installer

When planning for pathway and surface design and construction, cost efficiencies can be made by obtaining surplus materials from contractors or involving material suppliers in the design process. To ensure a richer aesthetic look, and to add diversity and interest to any school ground area, limit large expanses of one type of surfacing. Existing large expanses of asphalt can be effectively used as painting canvases.

GATHERING PLACES

Amphitheatres and outdoor classrooms can double as places for learning and celebration. All gathering places require a sense of enclosure, a focus, places to sit and adequate space for large groups. Ideally, grade changes will be incorporated.



Gathering Places

Type of Gathering Place	Site Grading	Group Size	Ease of Construction	Comments
<i>Built Seating/Platforms</i>	Require a distinct change in grade, or fill	Can accommodate a large group size	Are not easy to build, so skilled workers are required	May only be used by large groups depending on size
<i>Bermed Areas</i>	Require shaping of land, possibly cuts and/or fills, good drainage and turf	Are ideal for a range of group sizes	Are relatively easy to build but earth-moving equipment is required	Can get worn down if use is heavy
<i>Rooms in a Grove</i>	Have varying requirements depending on site	Are suitable for small to medium groups	Are easy to build	Create a small, enclosed space good for group study and socializing

Chapter 5

APPROACHES TO MAINTENANCE

Unlike entirely natural systems, the fragmented landscapes within a school site require ongoing care and attention. The design of school yards as places of environmental enhancement, habitat creation and natural play spaces challenges the traditional machine- and energy-intensive approach to maintenance. A change in traditional maintenance practices along with an appropriate allocation of staff and resources is needed.

Typical challenges encountered by school district maintenance staff include

- finding a balance between managing school ground lands and facilitating school community involvement in their design and stewardship;
- competition between greening projects and other interests for maintenance funding;
- lack of cooperation between strategic partners, such as municipalities and non-governmental organizations;
- underdeveloped or poorly organized community stewardship programs;
- misunderstanding of the ongoing benefits of greening projects;
- lack of training for school and board members in native plant care and naturalized landscape maintenance;
- disparity between the lifespans of greening initiatives and traditional landscapes;
- nominal leadership within the education system; and
- waning school enthusiasm for stewardship.

MAINTENANCE STRATEGIES

Within the constraints of diminished school budgets and lack of enabling policy, maintenance departments have used various approaches to ensure that greening projects are effectively maintained. Strategies that have proved successful include the following:

- Clearly establishing, early in the planning process, who will be responsible for the ongoing maintenance of the project. Will it be the school greening committee or the maintenance department?
- Establishing formal maintenance agreements between the partners responsible for maintenance to ensure a clear understanding of responsibilities (see Appendix C).
- Considering maintenance strategies carefully during the planning and design

stages of the project. Has a realistic budget for maintenance been prepared?
How can the energy and water requirements of the landscape be reduced?

- Reconsidering the school district's historical approach to school yard landscape upkeep. For example, if bulb plantings have been a cornerstone of the school yard landscape, could they be replaced by components that meet naturalization criteria?
- Developing a clear understanding of the fundamental purpose of the school greening initiative, maintenance criteria and upkeep requirements among grounds workers, tradespeople and summer maintenance staff.
- Establishing a sense of project ownership among students and school staff as well as the wider community so that the project is respected and there is enthusiasm for upkeep.

A sophisticated response to maintenance is required if the full value of school ground greening is to be realized. That means adopting sound maintenance strategies while providing leadership around changes necessary to ensure better informed and equipped stakeholders.

Leadership

Leadership that reflects a commitment to greening projects is essential for successful maintenance. Provincially adopted policy and budgets that recognize the importance of greening projects send a strong message to school boards that they should invest in their development and maintenance. Board-adopted policies that guide staff in the implementation of greening projects and guidelines that outline design processes and maintenance are key to long-term success.

In Nova Scotia, the Ministry of Education provides support in kind (office space and phone and fax service, etc.) for the coordination of greening initiatives in partnership with Tree Canada. And the Toronto District School Board has committed to funding for the maintenance of its new school landscapes. These types of leadership actions set the tone for districts, boards and schools across the country.

Training

Training staff and volunteers in the upkeep of native plantings and other greening components may help to break down some of the long-held patterns of "garden" maintenance that can work against the long-term success of a project. The care of native plants requires an understanding of their native ecological settings and preference for specific soils and water regimes.

In 2001 the Strait Regional School Board in Nova Scotia organized a series of workshops for maintenance staff from 12 schools. Led by a local landscape architect and nursery operator, the sessions trained staff in the planting, pruning and landscape care of greening projects.

The City of Waterloo in Ontario has conducted professional development workshops for staff in the Environmental Services Division. They have introduced participants to the concept of naturalization and provided information on site management and maintenance. The workshops have been supplemented by lunch-time presentations on a variety of naturalization topics.

Consider This!

- *Training for teachers and administrators in the educational opportunities of school ground landscapes in general and maintenance in particular*
 - *An educational program that offers ongoing support to individual schools and classes on outdoor experiential learning systems*
 - *Field visits by local horticulturists or forestry or natural resources staff for “in-service” and professional development days*
 - *Talks by ecologists and biologists that explain the nuances of the project to staff, administrators and volunteers*
 - *Extension courses from universities and colleges for staff*
 - *Development of a training guide specific to the region*
-

Partnerships and Joint-Use Agreements

School grounds constitute some of the largest green spaces in urban areas and many are part of, or linked to, municipal park systems. School ground greening can contribute to many of the ecological planning objectives of city parks and planning departments. Partnerships in which school districts agree to develop greening projects that benefit citywide or regional greening objectives in return for maintenance assistance from local governments should be pursued. Some school districts already share the use and maintenance responsibilities of school playfields with local municipalities.

For example, the City of Winnipeg is responsible for the maintenance of school ground areas that lie beyond the immediate vicinity of school buildings. Naturalists employed by the municipality to work on parkland naturalization also lend support to, and facilitate the development of, school ground naturalization projects. According to Cheryl Heming, City of Winnipeg naturalist, successful habitat restoration projects require someone with expertise in the field – either a naturalist or habitat biologist who understands the complex relationships between the various components of the ecosystem. In another example, Strathroy, Ontario, has developed a school site that is used in part for a stormwater management pond. It fulfills both engineering and recreational functions that benefit both parties.

Maintenance Funding

Funding is one of the key issues school boards must consider when planning adequate maintenance of greening initiatives. Projects consume resources in terms of both staff time and materials. Without adequate budget allocations from provincial governments and school boards, schools and maintenance departments are forced to find innovative ways to ensure that greening projects succeed in the long run.

Some of the needed expertise and materials can be provided through partnership agreements and the donation of in-kind resources. Local municipalities have valuable expertise in open-space planning and ecology that might be shared with schools.

Some school districts have found it necessary to institute a holding fund in which monies are held to cover expenses that may arise due to vandalism or replacement of certain elements. The amounts of these funds can range from \$1,000 to \$5,000 depending on the level of confidence the project team has in the maintenance program as well as the type and scale of the project. This money is generally used only if a project has failed or been neglected.

As projects are built across a district, individual maintenance funds can be pooled to form a joint fund. In this way, the “trust fund” can be leveraged so as to cover more projects and satisfy the need for a fall-back source of funding if a project does not work out as planned.

Rand Mackenzie, maintenance manager for the Delta (British Columbia) School District, predicts that a \$5,000 maintenance trust fund will be required in the not-too-distant future for school ground greening projects in his community. “We believe this will help ensure the long-term success of the greening projects once they require maintenance and, eventually, replacement,” Mackenzie says. The fact is, however, that most parent groups have difficulty raising sufficient funds for project installation let alone maintenance funds. Consequently, larger maintenance funds may only be appropriate for larger jurisdictions and large-scale projects. Provincial and federal agencies responsible directly and indirectly for the health and care of children could contribute to school greening trust funds. Letters of credit that offer school boards and districts sufficient levels of backup for those rare occasions when a project fails could be endorsed, for example.

Corporate donors, increasingly aware of the potential marketing benefits of sponsoring environmental learning opportunities, present alternative sources of direct funding. They may also provide letters of credit that would supplement maintenance trust funds.

The Belgravia School Greening Committee in Edmonton has agreed to maintain a \$1,000 maintenance fund to implement any neglected maintenance requirements or to implement the demise of the project as per the Sunset Clause Agreement (see Appendix A).

[The Waterloo Region District School Board in Ontario] has developed a booklet that assists teachers in developing an environmental education program that fits within the provincial curriculum. Structured around seven core ecological concepts, this booklet builds on existing elements of the curriculum and fills the gaps with activities appropriate for grades 1 through 6.

*Waterloo Region District
School Board, 2000*

Stewardship Programs

Building ownership at different levels within the school, the community and the district is the key to sustaining greening projects over time. Stewardship programs foster a land ethic in students and adults and build community through cooperation and collaboration. They can also be effective maintenance cost-sharing mechanisms that allow limited budgets to be stretched through creative partnerships between staff, skilled professionals and enthusiastic volunteers.

The Nova Scotia Department of Transportation and Public Works (2001) has recognized the value of school-based stewardship, ranging from the involvement of students in mapping, inventorying and project maintenance to the involvement of students, parents and community members in design and planning: "In this way, each school will be unique and the community will [experience] stewardship of their grounds while enjoying them."

The best way to ensure that active stewardship of planted spaces continues and that students are learning along the way is to link the curriculum to everything from planning to planting to watering and weeding. Stewardship programs then answer to both maintenance and curriculum goals. Writing letters of support, creatively describing the unfolding of the project over time or in different seasons, or putting on a short play in a garden based on nature themes can contribute to the language arts. Drawing a plan of the project on graph paper can be a valuable lesson in scale and representation, and mapping patterns of sun and shade valuable lessons in climate, astronomy and plant requirements. Testing soil pH, type and percolation rates and examining ecosystems, habitat requirements and predator-prey relationships are valuable applied science lessons. These can be supplemented with theories of sustainable development, climate change, conservation and environmental protection.

Stewardship programs can be supported all year if partnerships with neighbourhood organizations and individuals are established. When members of the school community are unavailable – for example, over the summer holidays – weeding and watering of the planting projects will still be completed.

Establishing a Maintenance Plan

Maintenance criteria should be established and incorporated into an annual maintenance plan for each project (see Appendix B). An effective maintenance plan includes the following:

- A statement of intent, describing the key purpose of the project, how it was built, who was involved and the educational and environmental objectives.
- A description of the ecological considerations that affect maintenance. These might include the role of habitat components (food, water, shelter and breeding); the function of water-related components; the function and relationships of plants on the site; and the areas that should not be disturbed at critical times (such as nesting season).

- A description of the educational considerations that affect maintenance, including the times of year when certain sections of the project will be heavily used and, as a result, maintenance tasks will be interfered with; and the frequency with which interpretive elements should be monitored, cleaned and repainted or resurfaced.
- A detailed maintenance task list, including a checklist of tasks; the timing of tasks and actions related to maintenance; and estimates of the amount of time required to complete maintenance work.

REJUVENATING A NEGLECTED PROJECT

Most artificial landscapes, including school greening projects, ultimately reach the end of their useful existence. At this point the difficult question of how to breathe new life into the project arises. For that reason the inclusion of a sunset clause in an initial agreement made between the maintenance department and the school can be beneficial (see Appendix A). It will typically include the following elements:

- Criteria for altering the greening project (i.e., the circumstances under which the sunset clause will be invoked)
- A framework for deciding what elements, if any, will remain
- The naming of the organization, group or association that will pay for the renovation
- The naming of the groups that will be responsible for the decommissioning process

Ask This!

- *Has the project fulfilled its purpose?*
 - *How does that purpose need to change to adapt to new circumstances and needs?*
 - *Does a constituency that uses and maintains the project remain?*
 - *Are there sufficient resources with which to repair/renovate the site?*
 - *What management changes can be made to ensure the ongoing success of the project?*
-

Chapter 6

VOLUNTEERISM ON SCHOOL GROUNDS

Currently, in many school districts, volunteers are responsible for the majority of the organizational and fundraising work that goes into bringing a greening project to life. Without them, most greening projects in Canada would not exist. It is to be hoped that in the future a more balanced partnership in which school districts fully support the efforts of individual schools to create greening projects will emerge.

Site and facilities managers who help to establish links between schools and community groups (such as the Girl Guides, the Boy Scouts, non-governmental land protection groups and civic leaders) will find that their school greening programs are more robust and likely to thrive over time. Unions and skilled trade organizations, some of which may have members working for the school district, may also be enthusiastic about participating in greening initiatives.

When play leaders and the community are not involved in decision making, fixed rigid equipment is a compromise and perhaps a symbol of having given up.

Eva Noren-Bjorn, Swedish Council for Children's Play, in Graham, 1999

VOLUNTEER AGREEMENTS

Some school boards and schools enter into volunteer agreements that formalize the roles and responsibilities of greening committees and student and community volunteers. Formal agreements with a legally defined entity can give school boards the level of comfort required to proceed with the authorization of a project.

After extensive negotiation with the school board, the school volunteers of Arthur Ford Public School in London, Ontario, formed a non-profit charitable organization called the Arthur Ford Outdoor Educational Foundation. Its role was and is the development and maintenance of outdoor naturalized space for the purposes of enhanced student learning on the school ground. The foundation entered into a legal agreement with the board of education for the City of London with respect to the greening project "to govern to orderly construction, cost thereof and future maintenance" (see Appendix C). The project has been highly successful and the agreement was renewed recently for a further five years. In addition, the charitable status attained by the foundation has enabled it to raise considerable sums of money for the enhancement and maintenance of the project.

INSURANCE FOR VOLUNTEERS

School board employees and students are usually covered by board insurance for activities on the school ground. It is important to ensure that parents and community volunteers who work on the school yard are also adequately covered. Third party public liability insurance will cover them if their work causes injury to

a member of the public. WCB insurance may be necessary to ensure coverage should they injure themselves during work on the school ground.

VOLUNTEERS AND UNIONS

In the early stages of a project, it is important to consult with CUPE or other local union representatives to ensure that agreements can be reached concerning volunteer work on project installation and/or maintenance. Despite possible controversy in this area, partnerships between volunteers and unions can be beneficial. For example, skilled trade union members can mentor and supervise volunteers who may have fewer skills but lots of enthusiasm. As a result, trade union members may experience increased job satisfaction. By increasing the role played by gardeners and operations staff, job security can be increased.

STUDENT GARDEN CLUBS

Garden clubs involve students in a structured way in curriculum-based greening projects. Run by parents or other community volunteers, they can continue to operate over the summer months, thereby ensuring that gardens are adequately weeded and watered. Additional help can come from

- boy scouts and girl guides;
- park volunteers;
- nursery and landscape associations;
- master gardener societies;
- horticultural students;
- the Audubon Society;
- environmental societies;
- provincial parks and recreation associations;
- provincial landscape architecture associations; and
- provincial planning associations.

Chapter 7

RECOMMENDATIONS AND CONCLUSIONS

School communities are sending a clear message that the time for change in the way school grounds are designed, maintained and used is now. It is imperative that land managers, school boards and communities work together to meet the challenge. School district departments and school boards will find efficiencies and make greater gains by working with the energy and passion carried by communities working on projects. Ensuring that Canadian children and youth are offered stimulating, creative and healthy landscapes to play in and learn from means a coordinated effort. It means that an integrated framework of support, ranging from policies to programs, is required. Such a framework is more than doable and is the only way to avoid a piecemeal approach to school ground change that typically ends up in start-and-die cycles.

In this final chapter, some suggestions are provided for various components of an integrated framework. In all of the suggestions provided, it is clear that leadership from decision makers is required to ensure that any change made is long-lasting. This less tangible piece of an integrated framework is nonetheless the most important.

PROMOTING SCHOOL GROUND INNOVATION

During the researching of this document, notable examples of maintenance departments and school districts that actively champion greening projects with clear educational objectives were discovered. Rather than simply acting as permitting agencies, these bodies have embraced the opportunities of school yard greening and harnessed groundswells of enthusiasm by acting as guides, advisers and facilitators. They have recognized that school grounds need to be richer and more diverse places of learning. Some of the strategies they have used to maximize greening benefits include the following:

- The Calgary Board of Education's Rob Illick has developed a comprehensive guide to the greening process and frequently delivers presentations to schools in the district, providing information on the level of commitment required, the process and requirements for approval, sources of funding, and elements of good design.
- The Waterloo Region District School Board in Ontario has produced a booklet that shows teachers how they can deliver environmental education using outdoor classrooms while meeting the provincial curriculum learning outcomes.

- Steve Repic of the Rocky View School District maintenance department in Alberta encourages each school in the district to develop a unique vision and approach that make each project stand out as truly different. He then makes resources available to support each project. His maintenance department takes over project maintenance after an initial period of three years, during which schools are required to show their level of commitment through stewardship and fundraising efforts.
- The Toronto District School Board has hired design professionals (architects and landscape architects) to facilitate the development of landscape master plans that reflect the values of the school board. It has also created a liaison position within the board between the maintenance department, facilities and the schools to ensure good process and the development of good projects. This liaison position is filled by a landscape architect.
- Nova Scotia's Department of Education works in partnership with Tree Canada to conduct work on school greening in the province, assisting with in-kind donations of office space and telephone service and opening channels of communication.

DESIGNING SCHOOLS FROM SCRATCH

Landscapes that address or incorporate educational and environmental considerations are not just for existing school yards. They should be incorporated into the site selection and design of new school facilities, too. School facilities planners can become acquainted with the solutions of environmentally responsible design. The British Columbia chapter of the U.S. Green Building Council recently prepared a guide to the LEED™ system for British Columbia. Developers can receive a green building rating based on objective criteria for energy efficiency, materials, water conservation measures and site design. Facilities planners could adapt such a system to recognize excellence in school ground design.

PROVINCIAL SUPPORT

Parents, teachers and non-profit organizations interested in improving the quality of children's education and the environment that they spend so much time in have been the driving force behind school ground greening. In a decade in which the imperatives of sustainable communities are of paramount importance, provincial governments can play a critical role by providing leadership and support for initiatives without affecting the community ownership that is essential to the success of most projects. Provinces could become involved by

- acknowledging that the design of school grounds and outdoor play areas has a profound impact on child development and learning;
- incorporating a greening project approach in curriculum development;
- acknowledging the value of outdoor spaces when developing budgets for facilities construction and maintenance;

- encouraging partnerships between municipalities, community developers and school districts to maximize the potential of school grounds through innovative construction and maintenance agreements;
- developing and implementing a set of guidelines and minimum standards regarding greening projects; and
- assisting with the retraining of maintenance staff.

FUNDING

It is often said that governments and school boards cannot afford to support school ground greening. But a progressive outdoor environment can contribute as much to a child's development as many indoor lessons. Along with provincial government commitments to environmental education, a formal recognition of the role school grounds play in reducing violence, improving children's health and meeting special education needs should be made. This in turn might help to establish a curriculum and budget basis that would enable administrators to allocate sufficient funds for the installation, maintenance and replacement of greening projects. Facility maintenance associations, school districts and administrators should consider lobbying provincial ministries to make this happen.

LOOKING TO THE FUTURE

Provincial education ministries, school district trustees and staff in many departments have a great opportunity to facilitate the transformation of school yards into landscapes that are profoundly more conducive to learning and in sync with local ecosystems. To do so requires leadership in the form of supportive policy, careful planning, responsive design and attention to the details of ongoing maintenance. It is a challenge that some have embraced, and their efforts are being rewarded with school grounds that are finally meeting the needs of the children who play there.

Appendices

APPENDIX A – SAMPLE SUNSET CLAUSE AGREEMENT

SUNSET CLAUSE AGREEMENT – BELGRAVIA SCHOOL OUTDOOR LEARNING CENTRE

1) The Belgravia School Outdoor Learning Centre project was [meant to] provide a generation of school students and neighbourhood children [with opportunities] to [...] create natural habitats and natural settings [with opportunities to] study the maturation of animal and plant material in an outdoor setting. The initiative was intended to cover a seven year period, from 1998 to 2005, at which time a thorough review of the site by the Committee, school administration and school district officials will take place. Any areas that do not meet the level of maintenance required by the school district will be restored to previous condition. The restoration efforts will include the following:

- remove all structures and landscape features
- eliminate annual and herbaceous plantings
- grade, level and seed or sod areas to be returned to a turf grass state
- woody perennials (trees and shrubs) may be retained on site if they can be maintained in-situ as specimen or mulched bed plantings

2) If at any time the Belgravia School Outdoor Learning Centre is no longer supported or maintained, the Committee, under the auspices of the Belgravia School PAC, will first seek out new partnerships who agree to continue the maintenance of the project. If no proponent can be found, the site will be restored as per above. The restoration efforts must be completed to satisfy lease arrangements with the original landowners.

Signed:

Principal	Date
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Chair, Belgravia School PAC	Date
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Chair, PAC Greening Committee	Date
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cc) Edmonton Public Schools, Land Development
City of Edmonton Community Services Department, South District CRC and
Operations Director

APPENDIX B – SAMPLE MAINTENANCE PLAN

BELGRAVIA OUTDOOR CLASSROOM – GENERAL MAINTENANCE PLAN 1999–2004

In consultation with the city's principal horticulturalist and south operations staff

Shrubs	Look at each year. Some will overgrow others and should be removed. E.g., on one of the berms 1 of 3 wolf willows is overshadowing a dogwood. One of these could be removed. In this case, remove a male plant.
Trees	For the Ash trees, look at a 5–8 year cycle for pruning. At year five, consider that one of the Ashes may be causing too much shade. Other trees should be watched but should not require significant attention during this maintenance cycle.
Mulch	Add new chips where necessary. Clear out some of the mulch when weeds no longer an issue and add native perennials.
Perennials	Add over the years to diversify plant materials on the site.
Pathways	Cut back on plant materials overlapping the trails to keep corridors open for use and to maintain sight lines.
Pond	Carry out weekly checks to make sure the pond is clear of litter, rocks, etc. Carry out yearly checks on the liner and plant material requirements as well as water quality.
Butterfly Garden	Ensure plants are tended and the area weeded on a regular basis.
Raised Gardens	Ensure enough soil is in the beds and carry out regular checks on the structure. Repair as needed.
Dock and Bridge	Carry out a yearly check on the dock and bridge for wear and tear. Replace or repair as necessary. Paint 2000, 2002 and 2004.
Litter	Ensure weekly checks carried out in order to keep tabs on any negative changes to the site.
General	<ul style="list-style-type: none"> • Annually review plant material lost and make note of additions required. • Consult with specialists for the various elements of the site on an ongoing basis. • Keep Manitoba Maples from taking hold on the various berms. • Twice yearly, carry out a major clean-up of the site.
Summer	Ensure that families are signed up to take on the responsibility of the site during summer months.
Prepare a yearly report for submission to parent advisory committee and school principal	
<i>Source: City of Edmonton Community Services Department, 1999</i>	

APPENDIX C – SAMPLE AGREEMENTS

A) LETTER OF UNDERSTANDING – BELGRAVIA SCHOOL OUTDOOR LEARNING CENTRE

Under the auspices of the Belgravia School Parent Advisory Committee (PAC), the Belgravia Greening Committee (the Committee) agrees to the following:

1. The purpose of the Committee is to manage, organize and co-ordinate the Belgravia School Outdoor Learning Centre for educational, environmental and aesthetic value and purpose.
2. The Committee will ensure that school district standards and policies are maintained, including respecting collective bargaining agreements and purchasing policies for services and materials.
3. The Committee will ensure that all partners, students and volunteers understand their roles and responsibilities.
4. The Committee will seek approval from the school district regarding proposed additions or changes to be made at the site; a layout plan indicating the changes is to be submitted to the school district four weeks prior to the anticipated implementation of changes to allow for the review and approval of the proposed changes.
5. The Committee will ensure that the project will be maintained at a high level of order, cleanliness and tidiness; weeds are to be kept under planned control, litter must be removed from the site, and tools and equipment, etc., are not to be left unattended; the level of maintenance will be consistent with the philosophically desired outcome of the project.
6. The Committee will ensure that any chemical applications required will meet all school district regulations and procedures.
7. The Committee will provide regular reports to the school administration and PAC.
8. It is understood that when the project is no longer supported or maintained to the level outlined in this letter of understanding, the attached 'Sunset Clause Agreement' will take effect.
9. The Committee will maintain an ongoing maintenance fund of \$1,000 to implement any neglected maintenance requirements or to implement the demise of the project as per the 'Sunset Clause Agreement'.

B) LEGAL AGREEMENT BETWEEN A SCHOOL BOARD AND NON-PROFIT ORGANIZATION – ARTHUR FORD OUTDOOR EDUCATIONAL FOUNDATION

THIS AGREEMENT made in duplicate this _____ day of 1988.

BETWEEN:

THE BOARD OF EDUCATION FOR THE CITY OF LONDON (Hereinafter called the “Board”)
OF THE FIRST PART

-and-

ARTHUR FORD OUTDOOR EDUCATIONAL FOUNDATION (Hereinafter called the “Foundation”)

WHEREAS the Board is the registered owner of those lands and premises more particularly described in Schedule “A” attached hereto;

AND WHEREAS the Foundation wishes to develop part of those lands and premises more particularly described in Schedule “A” attached hereto in accordance with the concept plan more particularly set forth in Schedule “B” attached hereto;

AND WHEREAS the Board and the Foundation are desirous of entering into the within Agreement to govern to orderly construction, cost thereof and future maintenance.

NOW THIS AGREEMENT WITNESSETH that in consideration of the mutual covenants hereinafter contained, the Board and the Foundation do hereby covenant, agree and provide each with the other as follows:

1. The Board shall contribute that portion of their lands described in Schedule “A” which are not required for building, parking, playground or associated purposes, for the purpose of a Nature Education Park as shown on Schedule “B” attached hereto.
2. The Foundation in consultation with the Board shall design the layout of a Nature Education Park and will select the type of all plants, shrubs, trees and related improvements including their location and the time of installation. The Foundation shall supply and pay for the installation of all plants, trees, shrubs and related improvements as well as the entire cost of construction of the Nature Education Park. All work on the site provided by outside contractors shall require prior approval by the Board.
3. The Foundation shall have access to the property at all reasonable times.
4. The Nature Education Park shall be available primarily to the students at Arthur Ford Public School as a learning facility. Notwithstanding the foregoing, the Nature Education Park shall also be available as a learning facility to other students within the Board’s jurisdiction as determined by the Program Department of the Board. The Board may also permit public access to and use of the Nature Education Park at all reasonable times on such terms and conditions as it deems

advisable and may provide any supervision and control of access and or use which it considers necessary at its sole discretion.

5. The Board shall be responsible for the day to day supervision of the Nature Education Park. The Board shall also be responsible for the day to day maintenance of the Nature Education Park during the normal school year. The Foundation shall be responsible for the maintenance of the Nature Education Park during the summer months.

6. The Foundation shall be responsible for and shall pay for the cost of construction, maintenance and replacement of all the plants, shrubs, trees and related improvements (including landscaping) associated with the Nature Education Park and to that end the Foundation shall initially deposit with the Board a sum to be applied by the Board to cover its costs associated with the Nature Education Park, if any Board services are required.

7. The term of this Agreement shall be ten (10) years and may be renewed by the Foundation for two (2) further terms of five (5) years each, upon the same terms and conditions, save and except for the right of further renewal.

8. Notwithstanding anything herein contained to the contrary, this Agreement may be terminated either by the Foundation or the Board upon six (6) months' notice in writing by the other party.

9. The Board shall provide liability insurance with respect to the Nature Education Park.

10. The Foundation covenants and agrees with the Board that upon completion of construction of the Nature Education Park, the Foundation will establish a reserve fund in an amount to be agreed upon between the parties, the interest from which fund will be used to maintain the park during school summer vacation and also to provide a long term replacement program of shrubs, trees and plants.

11. Any notice given under this Agreement shall be sufficiently given if delivered personally or sent by pre-paid class mail to the Board of Education for the City of London, The Education Centre, 1250 Dundas Street, P.O. Box 5888, London, Ontario, Canada N6A 5L1. Attention: Director of Education and to the Arthur Ford Outdoor Educational Foundation, c/o [name & address suppressed].

IN WITNESS WHEREOF this Agreement has been executed by the London Board of Education for the City of London and by the Arthur Ford Outdoor Educational Foundation.

THE BOARD OF EDUCATION
FOR THE CITY OF LONDON:

Per:
Per:

ARTHUR FORD OUTDOOR
EDUCATIONAL FOUNDATION:

Per:
Per:

References and Resources

REFERENCES CITED IN THE TEXT

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Additional Resources

www.evergreen.ca

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Evergreen

Evergreen is a national non-profit environmental organization with a mandate to bring nature to our cities through naturalization projects. Evergreen motivates people to create and sustain healthy, natural outdoor spaces and gives them practical tools to be successful through its three core programs:

Learning Grounds (transforming school grounds); **Common Grounds** (working on publicly accessible land) and **Home Grounds** (for the home landscape). We believe that local stewardship creates vibrant neighbourhoods, a healthy natural environment and a sustainable society for all.

Toyota Evergreen Learning Grounds Program

Learning Grounds brings teachers, students and neighbours together to transform traditionally barren asphalt and turf school grounds into natural outdoor classrooms. By planting trees, shrubs and wild-flowers, planning meadows or ponds and creating murals, sculptures, vegetable gardens and other theme areas, the learning opportunities literally come alive. These outdoor classrooms provide students with a healthy and safe place to play, learn and develop a genuine respect for nature and each other.

Evergreen Tool Shed

The Tool Shed is an integrated collection of resources designed to inspire, educate and guide students, teachers, planners, community groups and individuals through all stages of a school, community or home naturalization project. The Tool Shed series includes guide books, instructional and inspirational videos, fact sheets, case studies, newsletters, research reports and an on-line registry. For the latest information on Evergreen's Tool Shed resources, check out our Web site at www.evergreen.ca.

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