GREENING THE SCHOOLYARD

Creating a Ten Year Green Schoolyard Plan for R.F. Downey Public School

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GEOG 4700: Research in Human Geography

Presented to: R.F. Downey Public School
Academic Supervisor: Heather Nicol
Host Supervisor: Emily Straka

TRENT UNIVERSITY

R.F. Downey Public School DINOSMITES Be The Best You Can Be

The Trent Centre for Community-Based Education

Greening the Schoolyard

Includes:
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-Kristin & Julie

Abstract

The schoolyard plays an important role in the healthy development of students and is a space that can be used not only for academic learning, but also for fostering a sense of community. 'Greening' or building natural environments in schoolyards can enhance the overall educational experience of the child, and may even have an impact later on in their adult life.

R.F. Downey Public School is dedicated to providing its students with learning opportunities outside of the classroom that incorporate the environment and, specifically, the schoolyard. Examining the current conditions of the schoolyard and making a Ten Year Green Schoolyard Plan will help to continue this process of development in a structured and organized way. Using research and input from parents, staff, students and community members, the Plan outlines what additions to the schoolyard R.F. Downey Public School will benefit from most.

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1. Introduction

1.1 Purpose of the Project

The environments in which children play influence their childhood development. More and more, parents, teachers, staff and school boards are becoming aware of how the schoolyards can help or hinder children's play. R.F. Downey Public School, which is located in Peterborough, Ontario, sought the help of two research students at Trent University to document the current state of the schoolyard and to create an environmental enhancement plan that would benefit students, staff and community members connected with the school. In the Ten Year Green Schoolyard Plan for R.F. Downey Public School, we suggest various ways in which the school can work to create a greener schoolyard. This Plan will support R.F. Downey Public School in their efforts to promote a culture of sustainability and to engage in schoolyard greening practices within the school and surrounding community. By implementing a ten year plan, we hope to ensure the sustainability of the program despite changes in staff and students.

With this overall goal in mind, there were two main objectives that we worked with our host to achieve:

1. To develop an inventory of the vegetation and greening programmes already established at R.F. Downey Public School. This would allow for a better understanding of the current conditions of the schoolyard and how students and staff access them. This was used for later analysis to prepare for the second objective, the Ten Year Green Schoolyard Plan;

2. To create a Ten Year Green Schoolyard Plan with specific outcomes and goals established by the host (Emily Straka) and researchers (Kristin Boyd and Julie Gardner). This plan identifies the work to be done, and includes maps and suggestions as to what the school can do to continue to improve the future condition of the schoolyard establish a timeline for their implementation.

The following report outlines the answers to both of these research questions as well as background information about the project and the Ten Year Green Schoolyard Plan.

1.2 Key Research Terms

Geography: While there are numerous definitions of geography, the Trent University Geography Department has provided a useful definition of Geography: "Geography is the investigation of our natural world and how people share and interact with the planet. Studying the ways that humans relate with each other and the environment helps us understand how we shape the world and how our world shapes us." (Trent University, n.d.)

Green Schoolyard: A schoolyard that includes a school garden, a pond or water feature, a native garden, a food-system garden, solar panels, rainwater cisterns, a variety of accessible paths, varied habitats, a gathering place where an entire class can work together outside, seating areas for individuals and small groups, shaded areas, composting bins, creative features such as murals, mosaics, and paving stones and/or other ecologically appropriate teaching tools as one or more of its components. A green schoolyard can offer children hands-on opportunities to learn about plants and animals, the relationship between seasons and weather, the sun and

earth, the interrelationships between living things in the garden, and how to grow food and flowers and care for a garden. It also offers students a more holistic education and a chance to play a positive role in enriching the vitality of their communities. Children, teachers, parents, and community volunteers all have roles in maintaining the green schoolyard. (San Francisco Green Schoolyard Alliance, n.d.)

Kawartha Lakes District School Board: The Kawartha Pine Ridge District School Board (KPRDSB) is a school board that serves the Municipality of Clarington, Northumberland County and Peterborough County. Their mission is to educate their students to excel in learning, to succeed in life and to enrich their local communities. (Kawartha Pine Ridge District School Board, 2011)

Ontario Eco Schools (OCS): This program is an environmental education and certification program for grades ranging from Kindergarten to Grade 12, that helps school communities develop both ecological literacy and environmental practices. It attempts to assist them to become environmentally responsible citizens and to reduce the ecological footprint of schools. The OCS mission is that all students and staff in an Ontario school will be engaged in environmental education and environmentally responsible actions in order to develop the knowledge, skills, perspectives and practices needed to be active, environmentally responsible citizens. The program offers resources that provide an environmental perspective to the choices that are made in school operations and teaching the Ontario curriculum. The four main focus areas are ecological literacy, waste minimization, energy conservation, and school ground greening. (Ontario Eco Schools, 2011)

Peterborough: The city of Peterborough is located about two hours Northeast of Toronto on the Trent-Severn Waterway in the heart of the Kawartha region. Peterborough has a population of approximately 76,000 and has a multitude of recreational opportunities, diverse industrial and commercial and agricultural base, quality health facilities and a number of schools, including two post-secondary institutions. Among the Peterborough-based businesses that provide employment opportunities for many of the local people include PepsiCo Foods (Quaker), General Electric, FisherCast Global, Siemens Milltronics, Minute Maid, and SGS Lakefield Research. (City Of Peterborough, 2009)

Qualitative: A method of research which permits the researcher to study issues in depth and detail, with the researcher being the main instrument of inquiry. This type of research includes personal narratives and observation, in-depth and open ended interviews, direct observation and written documents, with a focus on open response categories. Due to the nature of this type of research, it generally uses a smaller sample size. (Patton, 1990)

Quantitative: A method of research that facilitates comparisons and statistical aggregation of data which is compiled into a standardized collection. The test items, survey questions and measurement tools, are seen as instruments of inquiry. This type of research can include questionnaires, structured interviews that include predetermined response categories. Quantitative research, due to the tools employed- such as surveys and questionnaires- usually has a large sample size. (Patton, 1990)

R.F. Downey: A Kindergarten to Grade 6 public primary school located in Northwestern Peterborough on 1221 Neptune Street. The school has approximately 215 students and 13 staff. The school's catchment area is both urban and rural, with approximately half of the students traveling to school by bus. (Kawartha Pine Ridge District School Board, 2011)

Urban Geography: "The geographical study of urban spaces and urban ways of being" (Lees, 2009, pp. 874). Urban geographers are interested in how flows of people, money, information and commodities in cities intersect and are accompanied by economic, political, social, and cultural change (Trent University Office of the Registrar, 2012).

1.3 Study Area

The City of Peterborough is located on the Trent-Severn Waterway about one-and-a-half hours Northeast of Toronto (see Figure 1). The population of Peterborough is approximately 135,000 (City of Peterborough, 2009). R.F. Downey Public School is located in Northwestern Peterborough on Neptune Street. The school is a part of the Kawartha Pine Ridge District School Board (KPRDSB) and is a primary school for Kindergarten to Grade Six. The school has approximately 215 students in ten classrooms. The students that attend the school come from a designated area provided by the KPRDSB (See Figure 2). According to Figure 3, a map designed by Elliot and Parr OLS (1995), the school grounds cover 8.55 acres of land. The area which will be used for this research project is highlighted on the map in green. Figure 4, an aerial photograph of R.F. Downey Public School's schoolyard and property, provides a useful view of the current vegetation and infrastructure on the schoolyard. Figure 5 is an updated

2012 version of the schoolyard plan that includes the Kindergarten addition scheduled to be built.

Figure 1- City of Peterborough location (City of Peterborough, 2009)

Figure 2- R.F. Downey Public School Catchment Area Boundaries (KPRDSB, 2011)

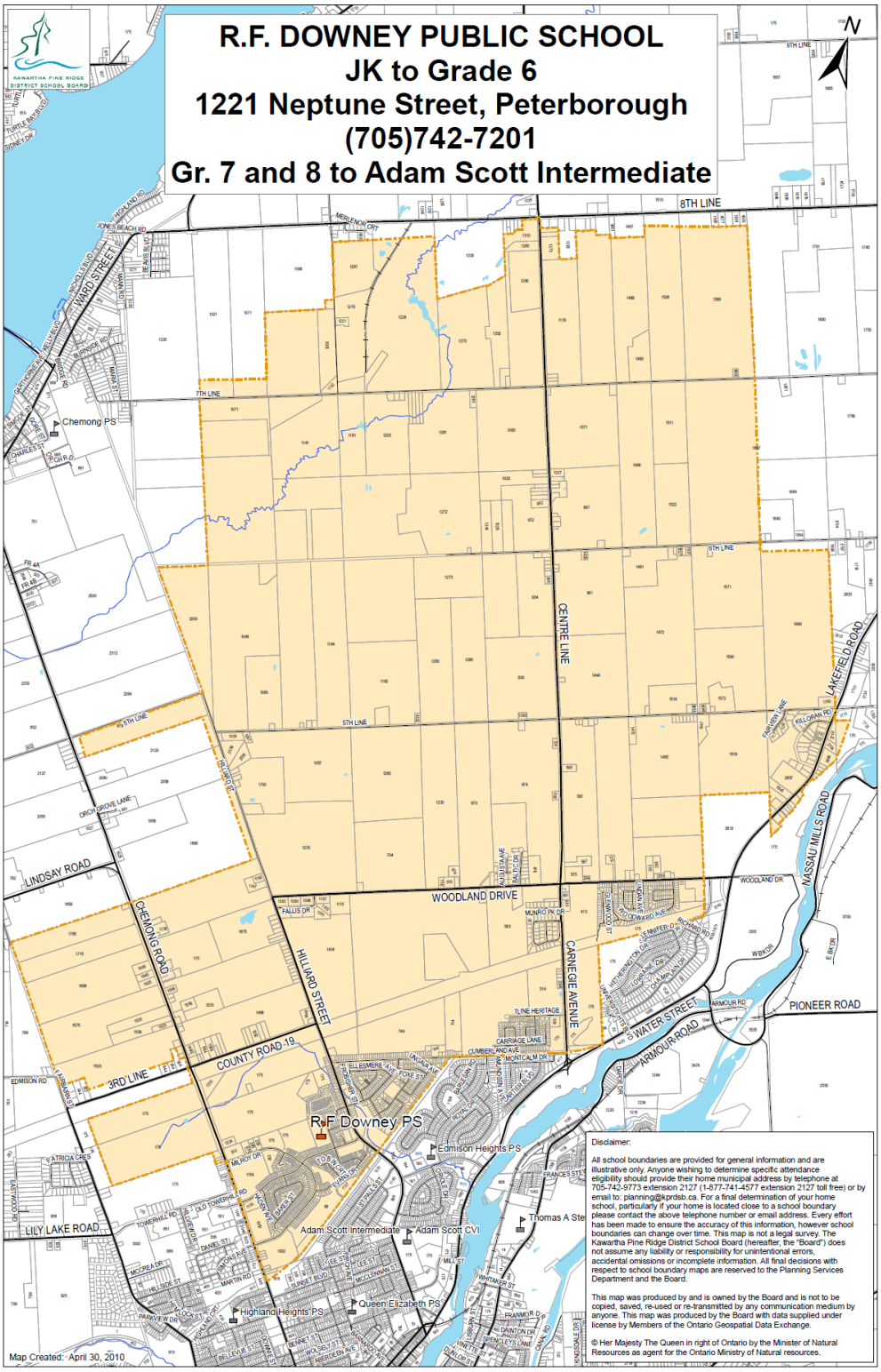


Figure 3- R.F. Downey Public Schoolyard Plan, 1995 (City of Peterborough, 1995)

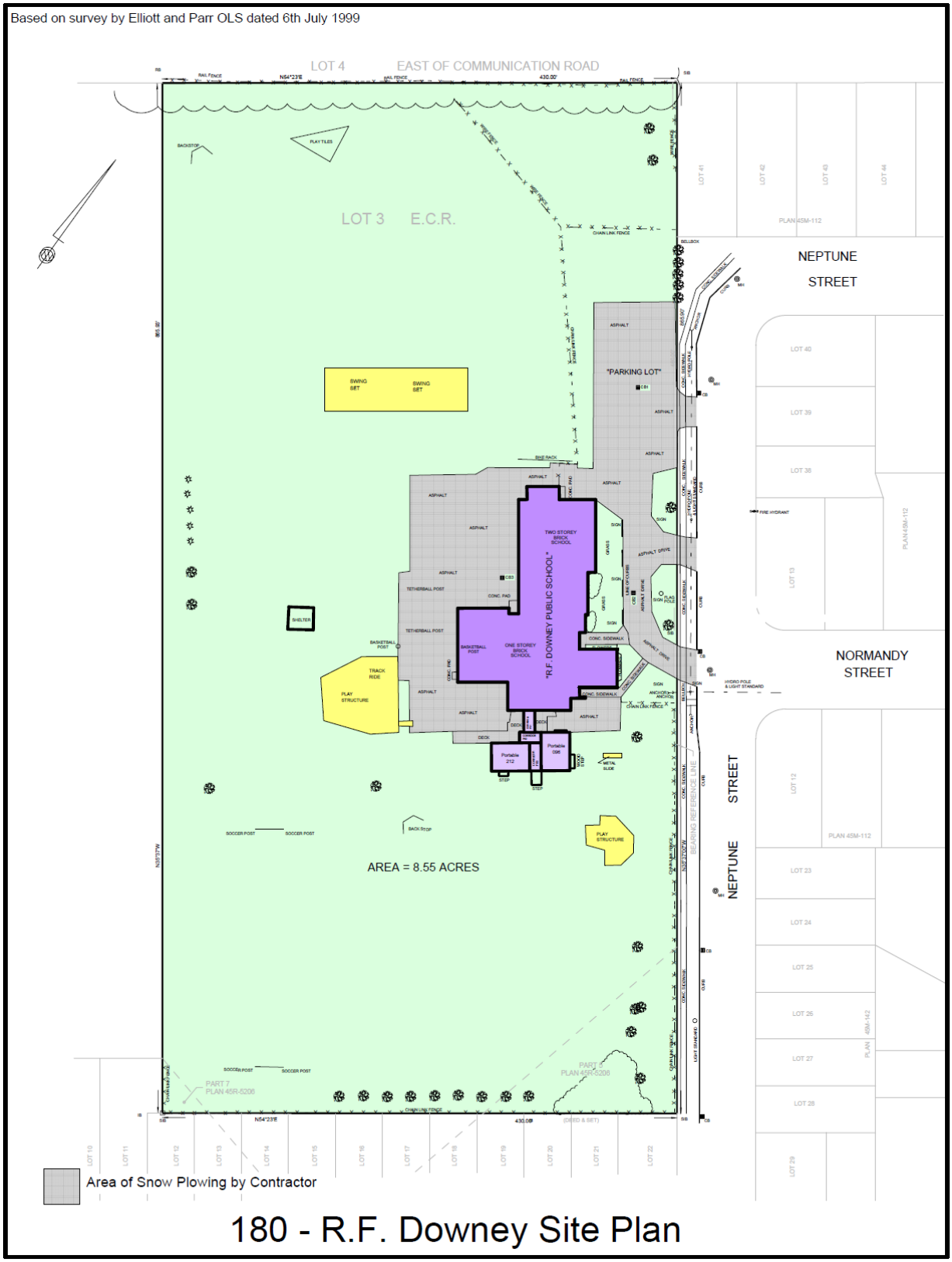


Figure 4- R.F. Downey Schoolyard aerial photograph (City of Peterborough, 2011)

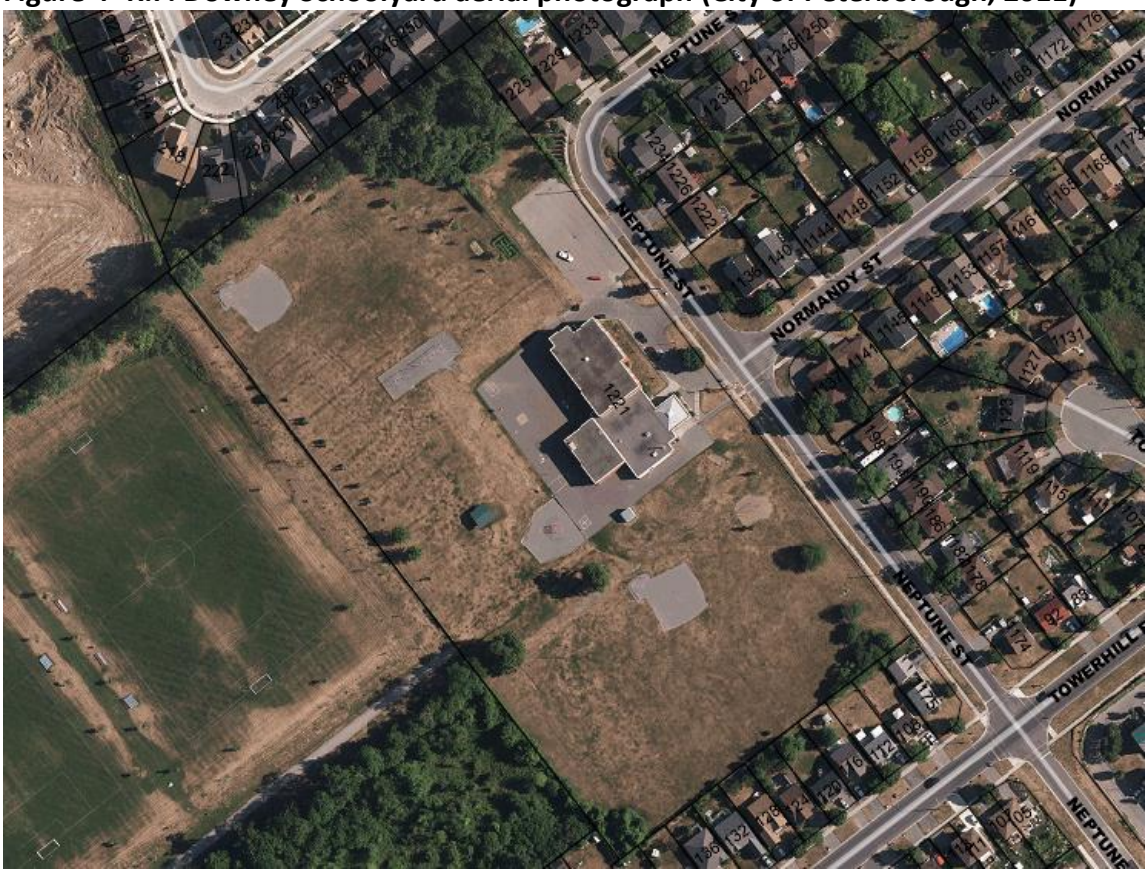
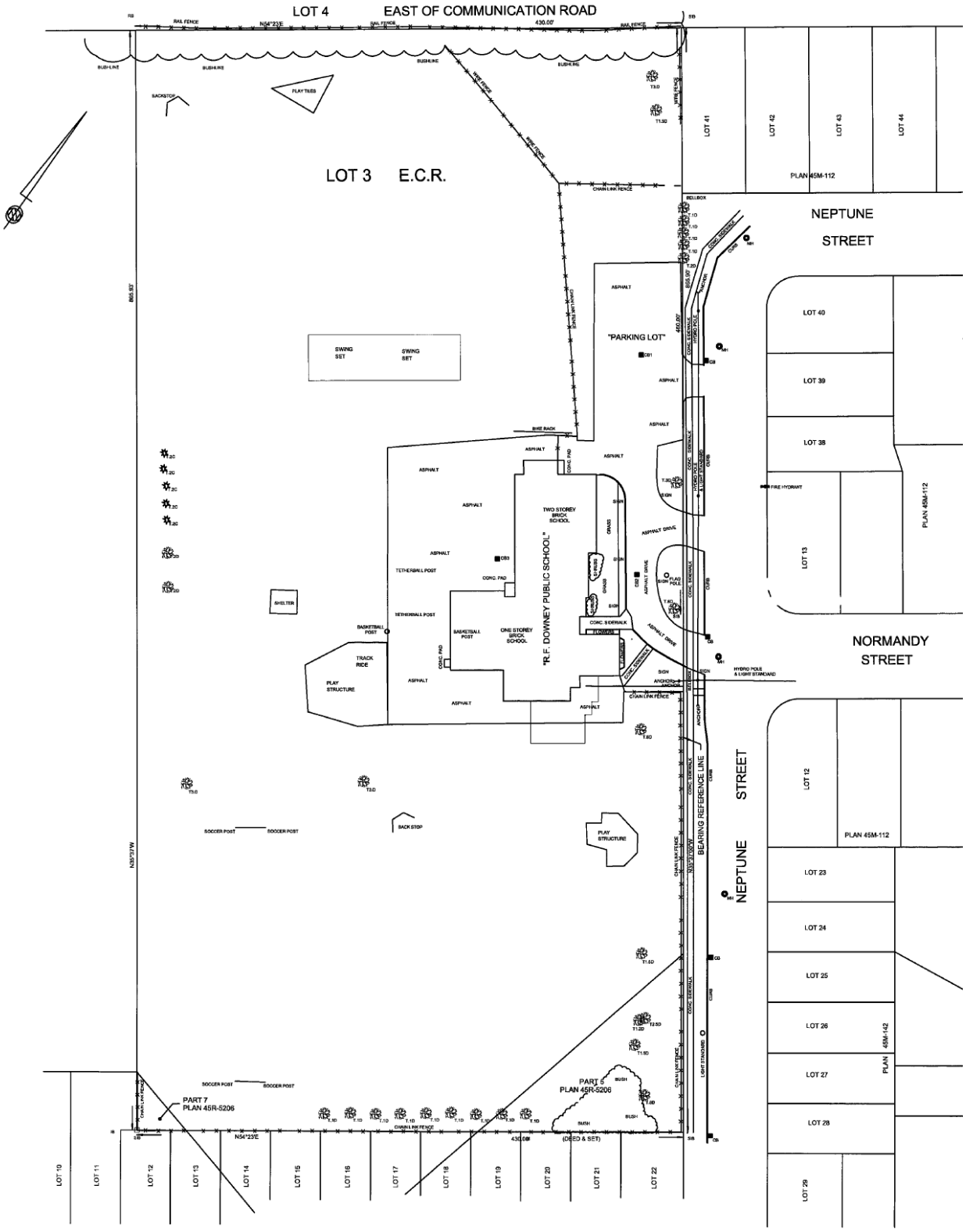


Figure 5- R.F. Downey Public School with the Planned Addition (KPRDSB, 2012)



2. Literature Review

The following literature review examines the benefits of green schoolyard programmes, as well as ways of establishing them. The reviewed literature and consolidated learning discussed below allows for a better understanding of the importance, process and best practices involved in greening a schoolyard; this information was particularly helpful when developing R.F. Downey Public School's Ten Year Green Schoolyard Plan.

2.1 Relevant Geographical Issues and Debates

Social geography is defined as "the sub-discipline that examines the social contexts, social processes and group relations that shape space, place, nature and landscape" (Ley, 2009). Within this research project, social geography relates to the ways in which the students, staff and community members of R.F. Downey Public School and the surrounding area have interact with the natural environment of the schoolyard in the past, present and future. By examining the schoolyard from a social geography perspective, a better understanding of the current use of the environment and how it is shaped socially is gained. This information is useful for the development of the Ten Year Green Schoolyard Plan.

Also related, environmental history examines how human actions have impacted the natural environment (Wynn, 2009). Recently being 'green' has become a popular topic within geographic research. Some argue that consumers are willing to pay more for 'green products' because of their less-negative impact on the environment (Griskevicius, Tybur& Van den Bergh, 2010). This makes it important for our research to examine the environment and how greening

a schoolyard can impact community choices. The environmental history of R.F. Downey Public School's schoolyard will be examined to aid in the creation of the Ten Year Green Schoolyard Plan. This should provide context for children to gain knowledge and understanding as to the origins of plants and food and the patterns and problems of food distribution. The project will also allow for R.F. Downey Public School to facilitate projects that promote environmental restoration and sustainability with involvement from the broader community.

2.2 Benefits of Schoolyards and Garden Programmes

The importance of green schoolyard programmes is evident from examining their benefits. Much research has been conducted to investigate these possible benefits for elementary school children. As Rivkin (1997) notes, from an evolutionary perspective, children need to experience the earth's natural and outdoor environments. Despite this, there are a number of factors that are keeping children away from natural and outdoor environments. Recently there has been a large focus on safety for children, which has consequently resulted in restricting their access to previous outdoor play areas (Rivkin, 1997). "The institutionalizing of children, beginning with school, and now child care, has been extended to include team sports, lessons, and camps. The hours spent transporting children among institutions also reduces children's time for outdoor exploration and play" (Rivkin, 1997, p. 62). Rivkin further argues that technology such as television, computers and video games, have kept children indoors because of their appealing entertainment and "parents' use of it for "child-minding"" (p. 62). Using bio-physical research, Rivkin (1997) argues a hypothesis that notes that as human beings, much as the need we have for contact with other human beings, we also have the need to

associate ourselves with natural environments in order to develop. Children who do not interact and play in natural habitats lack knowledge of their environment, thus developing a lack of care for it later on in adult life. It is important to have children involved in the natural environment, not only for their development, but to create future respect and a preservation ethic for the earth – an especially relevant issue this day in age.

Expanding on Rivkin's (1997) research, researchers have begun to understand the schoolyard as a play environment. Both Lindholm (1995) and Staempfli (2009) investigate good and bad schoolyards and evaluate different kinds of playgrounds. Lindholm (1995) suggests that "one American experience has shown that a change in the schoolyard's design, to give improved play opportunities, led to a change in the children's behaviour" (p. 259). Furthermore, Lindholm (1995) argues, children's development is often a reflection of the environment to which they are exposed. Lindholm (1995)'s own studies, which investigated good and bad schoolyards in London, determined that more activities took place on the good versus the bad. This was related to the fact that bad schoolyards had no "places in natural areas" on which to play (Lindholm, 1995, p. 271). Staempfli (2009) however, looked at outdoor play in relation to 'adventure playgrounds', particularly those located across Europe. These kinds of playgrounds, which are typically created from recycled 'junk' materials, incorporate play with the natural environment. Although these playgrounds are located outside of schoolyards and can only be accessed when a play worker is available to supervise, they not only promote freedom of choice of play for children, but can also have benefits such as reducing crime (Staempfli, 2009).

Despite some minor differences in their work, what both Staempfli (2009) and Lindholm (1995) stress, however, is the importance of playground design in influencing the development and freedom of play in children. What distinguishes a good from bad playground can further influence the development of children and interactions between staff and students. This is a theme which reverberates throughout the literature on playgrounds. When designing and constructing playgrounds within schoolyards, it can be argued that the structure and objects for play that are included are crucial in influencing the play of children using them.

Understanding the importance of the design process is useful in understanding the benefits related to schoolyard gardens and natural playgrounds. One of the first benefits discussed within the literature are the ability of a schoolyard garden to enhance students' learning academically. Many studies argue that outdoor schoolyard gardens help to promote, as Ozer (2007) notes, "hands-on, problem-based environmental and science education" (p. 847). Math, social sciences, history, environmental education and health are all subjects where curricula material can be learned using schoolyard gardens (Ozer, 2007; Dyment & Bell, 2008; Blair, 2009). One observation related to academic performance showed that "students who struggle with classroom learning "shine" in the garden. Group work in the garden may temporarily reshuffle the patterns of peer interactions based on classroom achievement" (Ozer, 2007, p. 857). Not only do schoolyard gardens provide more learning opportunities, but they can also help reduce classroom management problems (Dyment & Bell, 2008). In a study done by Lieberman and Hoody (1998) on how the environment impacts academic performance, "researchers found that enthusiasm for learning, standardized test scores, and GPAs were higher in 92% of the comparisons" (Blair, 2009, p. 16). Blair (2009) further notes that "gardens

ground children in growth and decay, predator-prey relations, pollination, carbon cycles, soil morphology, and microbial life: the simple and complex simultaneously" (p. 17). Thus, schoolyard gardens provide a benefit to students academically, allowing teachers to teach curricula outside of the classroom, incorporating the natural environment. This supports Rivkin's (1997) argument that children's exposure to natural and outdoor environments is important to the evolutionary and cognitive development of children.

Another benefit to schoolyard gardens is the social impact it has on both students and staff. In a study done on green schoolyard programmes in the Toronto District School Board, 44% of study participants reported a decrease in student problems and 45% reported a decrease in aggressive behaviour because of the presence of green school grounds. Children come from a variety of backgrounds and have a variety of needs. Dyment and Bell (2008) discuss the differences in play relating to gender, class and race, and intellectual and physical abilities. They note that boys and girls play differently and that schoolyards should be designed to promote inclusion of all genders and how they prefer to play (e.g. play where active boys can run around and play where quiet non-active boys can interact with the environment; Dyment and Bell, 2008). Since most schools within the Toronto District School Board have a diverse number of children with a variety of backgrounds, their research found that green schoolyard programmes socially supported play for new Canadian immigrants, fostering a sense of safety they may not have experienced in their home environments (Dyment and Bell, 2008). Furthermore, green schoolyard programmes are also beneficial to students with special needs (e.g. autism) because they support their individual desires to interact with the environment the way they want to (e.g. hugging a tree during recess was therapeutic; Dyment and Bell, 2008).

Within this study, it was also discovered that 72% of students were more civil, 63% communicated more effectively, 69% were more cooperative and 69% had better interactions between students and teachers because of green schoolyard programmes (Dyment and Bell, 2008). Thus, it can be argued that green schoolyard programmes contribute to social inclusion and improvement amongst students and teachers.

Finally, among the most noticeable benefits of green schoolyard programmes are those related to health. Schoolyard gardens traditionally allow students to see the entire process of food production from planting, growing, picking and eating. As Ratcliffe, Merrigan, Rogers & Goldberg (2011) note, "consumption of the recommended amounts of fruits and vegetables is associated with prevention and control of many chronic conditions such as diabetes, hypertension, obesity, cardiovascular diseases, and some cancers" (p. 36). Schoolyard gardens can directly influence student's values and opinions, and thus consumption of vegetables and fruits. The study found that students were more willing to taste more vegetables, were better able to identify vegetables, and ate a wider variety of vegetables if they were involved in schoolyard garden programmes. This was significant for health reasons, as vegetable and fruit consumption in young children contributes to their eating habits later on in their adolescent and adult life. (Ratcliffe et al., 2011) Ozer (2007) notes that "nutrition curricula use in conjunction with some school garden programmes teach topics such as food groups, nutritional and energy needs, how to read nutrition labelling, appropriate portion size, and the benefits of eating unprocessed foods" (p. 853). This can lead to students feeling more connected to their school environments, which, as discussed by Ozer (2007), decreases levels of emotional distrees, risk behaviour and aggression, later on in adolescence. Finally, nutritional intake is an

important part of academic wellness; schoolyard garden programmes, and the learning linked with it, help stress the importance of nutrition (Ozer, 2007).

2.3 Lessons on How to Establish Green Schoolyard Programmes

This section is an attempt to capture and consolidate the learning from schools that established green schoolyard programmes. Because green schoolyard programmes have typically been 'grassroots' initiatives; started and primarily administered by teachers, parents, students, and community members; there is little, if any, academic scholarship that deals directly with the process and best practices involved in creating green schoolyards. Thus, instead of focusing on what scholars have said on the matter, this section will be based on the experience of individual schools which are involved in green schoolyard programmes. Their learning has been compiled into resource documents released by organizations and individuals interested in promoting green schoolyards, and making it easier for other schools to do so.

2.3.1 How to Get Started

The establishment of green schoolyard programmes within schools is a very organic process; thus, there is no one way that these programmes can be developed or implemented. For some schools, such as Grandview/?uuqinak'uuk Elementary School in Vancouver, British Columbia it was a proposal to transform the school ground put forward by graduate students that set the process of greening their schoolyard into motion. The administration responded enthusiastically to the initiative and the graduate students began conducting planning workshops with students, teachers, parents, and community members. The green schoolyard programme at Windsor School, in Winnipeg, Manitoba, began when parents and teachers

realized that the kindergarten class's failure to find spiders in their schoolyard in order to complete a class assignment was really indicative of a larger problem. Through the 'Home and School Association,' parents and teachers came together to discuss a possible plan of action to create a more natural environment at their school (Bell, 2001).

The schoolyard programmes at St. Monica's Catholic School in Barrie, Ontario, started with the establishment of a small teaching garden at the back of the school. From there, the programme expanded to include other aspects, such as a butterfly garden, a pond and patio garden and keeps growing to this day. Green schoolyard programmes at Les Petits Castors, Lonqueuil, Quebec and Belgravia Elementary School, Edmonton, Alberta, began with extensive student consultation, planning and hands-on involvement – from the very beginning. The green schoolyard programme at Dartmouth High School, in Dartmouth, Nova Scotia, began when an individual student decided to set up the programme, with support from fellow students and teachers, as part of a course credit in leadership. Interested students and staff then formed 'Grassroots,' a group whose mission was to restore and beautify the school ground. (Bell, 2001)

2.3.2 What Green Schoolyard Programmes Have Included

Green schoolyard programmes can include a variety of elements; usually starting with an initial plan, these elements develop gradually as the needs of the students and staff change over time. The following table illustrates some of the elements past and current green schoolyards have included:

Table 1- Collaboration of past and current green schoolyard programmes from other schools.

Element	School
vegetable and flower gardens	Les Petites Castors, Grandview/?uuqinak'uuh Elementary School, Belgravia Elementary School, Windsor School, Dartmouth High School
community gardens	Grandview/?uuqinak'uuh Elementary School
habitat gardens	Grandview/?uuqinak'uuh Elementary School, Belgravia Elementary School
butterfly gardens	Belgravia Elementary School, St. Monica's Catholic School
ethno botanical gardens	Grandview/?uuqinak'uuh Elementary School, Belgravia Elementary School
greenhouse	Dartmouth High School
worm composting	Les Petites Castors
tree nursery	St. Monica's Catholic School, Les Petites Castors
bird and bat houses	Belgravia Elementary School, St. Monica's Catholic School
native shrub collections	Windsor School, Les Petites Castors
woodlands	St Monica's Catholic School
meadows	Windsor School
ponds	Belgravia Elementary School, St. Monica's Catholic School, Dartmouth High School
ecological drainage systems	Grandview/?uuqinak'uuh Elementary School
outdoor classrooms	Grandview/?uuqinak'uuh Elementary School, Windsor School
sun shelters	St. Monica's Catholic School
seating	Belgravia Elementary School, Dartmouth High School
large rocks	St. Monica's Catholic School
shade trees	St. Monica's Catholic School
pathways	Les Petites Castors School, Dartmouth High School
public art installations	Grandview/?uuqinak'uuh Elementary School
community map mural game	Windsor School
sundials	Belgravia Elementary School, Windsor School
time capsule	Dartmouth High School
archway	Dartmouth High School

(Bell, 2001).

2.3.3 Who is Involved in Green Schoolyard Programmes

a. Students

In all of schools that established green schoolyard programmes, the involvement of students from the very beginning is vital. Many schools, including Grandview/?uuqinak'uuk

Elementary School and Dartmouth High School, incorporated the children's suggestions into the master plan right from the beginning. Student leadership and involvement in green schoolyard programmes, such as at Les Petits Castors and Belgravia Elementary School, has proven to be vital to their success. Students have been involved in the process of implementing green schoolyard programmes at their schools in a number of ways. For instance, one of the classes at Grandview/?uuqinak'uuk Elementary School, after having visited the Museum of Anthropology to research and record weaving patterns, designed and helped to build patios incorporating Coast Salish weaving patterns; other students at Grandview/?uuqinak'uuk Elementary School participated in the creation and painting of totem poles of the long house. (Bell, 2001)

b. Teachers and Community

According to Newman and Lavoie (2003), volunteers play an essential role in bringing nature back into communities, including into schoolyards. Volunteers assisting and often driving these initiatives include teachers, parents and other community members (Newman & Lavoie, 2003). Illène, one of the graduate students that helped initiate the green schoolyard programme at Grandview/?uuqinak'uuh Elementary School, remarked that the most important element of the programme was "…the cooperation at all levels of community. Cooperation of kids, teachers, neighbours, gardening organizations, funders, corporations—the cooperative effort is what has made it possible" (Bell, 2001, p. 8). Behind most green schoolyard programmes is a single or group of teachers and parents that have voluntarily dedicated their time and effort to establish and maintain the programmes. For example, at

Windsor School, through the Home and School Association, a group of parents and teachers came together to create a plan for greening their school's schoolyard. (Bell, 2001)

At Benjamin Franklin School in Cleveland, Ohio, master gardeners met one day a week with the students to help them in their garden. With the help of the Extension Agent for Horticulture and Natural Resources, the master gardeners gathered curriculum materials and designed a year's worth of lesson plans (American Community Gardening Association, 1999). At St. Monica's Catholic School, they have a summer maintenance schedule of school families to keep the garden in-shape in the holiday months (Bell, 2001). There are numerous examples of instances where teachers, parents, and other community members have played essential roles in establishing and maintaining green schoolyard programmes; most sources have shown that a stable base of supporters ensures their sustainability.

c. Organizations

There are a number of organizations that promote and support green schoolyards. One such organization is Evergreen, whose mission is to bring communities and nature together by engaging people in creating and sustaining healthy, dynamic outdoor spaces at schools, in communities and homes (Wolanski, 2002). To help reconnect children to the outdoors, the official website of the National Wildlife Federation offers to assist educators and students to learn how to attract and support local wildlife and develop outdoor classrooms through their 'Schoolyard Habitats' programme (National Wildlife Federation, 2012). The Center for Ecoliteracy, a leader in the green schools movement, helps schools' gardens and lunch programmes, and assists in integrating sustainability into curricula. The

Center also offers books, teaching guides, professional development seminars, a sustainability leadership academy, and consulting services (Rauzon, Wang, Studer & Crawford, 2010).

The American Community Gardeners Association's *Community Garden Review* states that association members have received an "increasing number of 'calls for help'" from schools requiring assistance with their green schoolyard programmes. One of the significant ways that these organizations assist green schoolyard programmes is through funding. For example, the National Gardening Association has provided 300 'seed-and equipment grants' worth $750 each, to school and youth gardens. (American Community Gardening Association, 1999) The above listed organizations are only a handful of organizations that can provide assistance to schools establishing green schoolyard programmes.

d. Businesses

Literature that deals with green schoolyard programmes also speaks of businesses that serve these programmes. The 'Green Schoolyard Resource Directory for the San Francisco Bay Area,' for example, includes a section listing businesses and professionals; like architects, landscape architects, and other design professionals; that can offer their expertise to schools developing their green schoolyard programmes. The directory also lists soil testing laboratories and businesses that can assist with setting-up composting programmes, and business that sell seeds, plants, tools that can be used in school gardens (Cooper & Danks, 2006). Businesses such as the Chez Panisse Restaurant have also contributed to green schoolyards by creating and administrating programmes such as the 'The Edible Schoolyard Program.' The programme includes a one-acre organic garden and kitchen classroom at

Martin Luther King, Jr. Middle School in Berkeley, California where students learn the connections between food, health, and the environment (Chez Panisse Foundation, 2006).

e. School Boards, Departments of Educations and Governments

Although most often green schoolyard programmes develop from the initiative of teachers, parents, and students, there are also cases that school boards or departments of education have promoted and headed schoolyard transformations in their jurisdictions. In California, for example, the Department of Education has the "A Garden in Every School" programme. This programme attempts to keep up with the interest in building gardens and the need for curricular materials (American Community Gardening Association, 1999). The programme was recognized by the Governor and Legislature for its educational and health benefits; as a result, several bills that promoted instructional school gardens were enacted in the United States. These include the Assembly Bill 1014, Instructional School Gardens (1999) which establishes the instructional school garden programme, the Senate Bill 19, The Pupil Health, Nutrition, and Achievement Act (2001) which identifies school gardens as one way to increase student preferences for fresh fruits and vegetables, the Assembly Bill 1634, Nutrition Education (2002) which further supports school gardens through identifying best practices and supporting a grant programme, and the Assembly Bill 1535, California Instructional School Garden Program (2006) which authorizes the CDE to award $15 million for grants to promote, develop, and sustain instructional school gardens. (California Department of Education, 2011)

2.4 Challenges

Although there are several benefits to green schoolyard programmes, as described above, it is also important to recognize some possible limitations and challenges green schoolyard programmes face. One of the first limitations many schools experience is funding. Re-designing and developing schoolyards to incorporate natural elements is expensive and many schools are restricted with the ability to fund such projects. Another limitation is related to the requirement of staff, both teachers and maintenance staff being required to maintain and supervise these projects, on top of their regular duties, without additional pay. At times, this is challenging because programmes can be established and then diminish due to change in staff previously running the programmes. Another issue is related to both experience and space; staffs require experience in gardening and planning as well as space needed to develop projects. These limitations are sometimes what can restrict a school from establishing and maintaining a schoolyard garden programme, thus negatively impacting the development of enrolled students.

Green schoolyards are sometimes under threat of being destroyed. This was the case for the schoolyard of P.S. 76, in Harlem, whose six year's work and almost $30, 000 in grants and donations schoolyard was destroyed by bulldozers (American Community Gardening Association, 1999). According to an article by the American Community Gardening Association, (1999), some other challenges that face green schoolyard programmes also include issues of vandalism and lack of support from superintendents. It is also important that native species versus foreign species of vegetation be included in the schoolyard; otherwise the green schoolyard programmes that are designed to be positive will, or might, have negative effects on

the environment by promoting the spread of foreign species that could contribute to the extinction of more vulnerable native species. It is also important for schools to take care to include vegetation that are 'hardy' enough not to be destroyed by students playing in the schoolyard. It will be important to take this into consideration when creating The Ten Year Green Schoolyard Plan for R.F. Downey Public School.

2.5 Conclusion

It is important to understand both the benefits and limitations of green schoolyard programmes and the schoolyard design process in general, in order to develop The Ten Year Green Schoolyard Plan for R.F. Downey Public School. By investigating the benefits and limitations, as well as reviewing the learning and approaches taken by other schools who established green schoolyard programmes of their own, we can support our recommendations in future development for the schoolyard.

3. Methods

For the research conducted, a mixed-methods approach of both qualitative and quantitative methods was used. Qualitative research investigates the relationship between human experiences and their environment (Hay, 2005). Through this approach, our research investigated the benefits of schoolyards and gardening programmes and the impact they can have on the lives of children, parents, teachers, community members and school staff. The main questions our qualitative research methods asked were: 1) what are the current experiences of those involved in R.F. Downey Public School in relation to the schoolyard; and 2) how can these experiences be improved by developing and implementing a Ten Year Green Schoolyard Plan. Quantitative methods use mathematical and statistical data to make conclusions. From this approach, our research involved collecting data on the inventory of current vegetation located within the schoolyard. This data was then recorded and analysed to provide an updated map of the current schoolyard design.

3.1 Participants

Within our research, the main participants were the students and staff who were enrolled or associated with R.F. Downey Public School, as well as parents and members of the larger community living in the adjacent neighbourhood. Due to Trent University research ethics considerations, students were not in direct contact with the researchers, and were only consulted indirectly, through the use of teachers. The main focus of involving students through the survey was to gather their current opinions on the conditions of the schoolyard and how

they wish to see it improved. School-age participants ranged in age from approximately four years to twelve years of age, and were enrolled in Junior Kindergarten to Grade Six. Staff were also consulted through semi-structured focus groups, with the goal of determining the participants view's on the schoolyard and how they hope to see it develop over time.

3.2 Materials

Most materials required for our research were involved in inventory collection and survey distribution For the inventory, for example, we developed a chart to collect the type of plants and record the picture number which was taken to record the plants. We also used our own personal digital camera to take the photos of the plants and other vegetation. Photocopies of the survey were printed by R.F. Downey Public School and students who participated in the surveys had access to computers for the online survey. A recorder, provided by Trent University's Geography Department, was used during the focus group.

3.3 Procedure

3.3.1 Textual Analysis

In order to better understand what constitutes a green schoolyard, research was conducted to investigate the definition of a green schoolyard, as well as what makes-up a good and bad schoolyard. Academic sources were consulted in order to understand two main topics of discussion: the benefits of green schoolyard programmes and lessons on how to establish green schoolyard programmes. Performing this literature review allowed for a background context to be gained by the researchers that aided in their understanding of past green

schoolyard projects in programmes, giving them a better idea of how The Ten Year Green Schoolyard Plan for R.F. Downey Public School should be developed.

3.3.2 Inventory of Vegetation

R.F. Downey Public School has over 8.55 acres of land with a variety of vegetation including native and non-native species. Some of the vegetation located on the schoolyard was present during the building process and not removed (e.g. small forested area located in the northeast corner). Other vegetation has been added over the years by both Parent Council and staff members (e.g. vegetable gardens, corn maze, trees, etc.). In order to further develop the schoolyard, an inventory of vegetation, greening programmes and other schoolyard infrastructure was taken in order to record the current condition of R.F. Downey Public School's schoolyard. Using a digital camera, pictures were taken of all plants, which recorded the location and type of plant. Our host, Emily Straka, helped to distinguish one plant from another due to her immense knowledge of the vegetation on the schoolyard. An inventory was also taken of structures and other relevant findings located on the schoolyard including play structures, baseball diamonds, soccer posts, composting bins, storage sheds, and water hose access. The data collected in the inventory helped to create an updated map of R.F. Downey Public School's schoolyard and will also provide the basis from which plans for the future development of the schoolyard, including the Ten Year Green Schoolyard Plan, will be made.

3.4 Surveys

Surveys within the research process were used to collect qualitative and quantitative data from parents, staff, students, and community members. A survey was developed and a

proposal was submitted to the Trent University Geography Department for ethics approval. The surveys for students were facilitated by host Emily Straka and other teachers during classroom periods throughout February. Ten classes from Junior Kindergarten to Grade 6 were surveyed orally via our host Emily Straka and the other teachers. The teachers manually recorded the students' answers. Seven students from Grades 4, 5, and 6 completed the survey online using Surveymonkey.com. All student surveys asked the same questions, testing students' knowledge of plants and animals as well as asking them their opinions about what they liked in the schoolyard and what they thought could be added or improved. A total of 182 students filled out the survey with 169 students responding through the oral survey and 13 through the online Surveymonkey.com. Surveys for staff members were sent out via e-mail by Emily Straka and completed online using Surveymonkey.com. Out of a total of 19 staff, seven surveys were received. Even though two reminder e-mails were sent to staff by Emily Straka, still responses from all the staff were not received. Like the staff survey, the parent survey was also set-up online via Surveymonkey.com. A note was sent home via the only or youngest child of the family explaining the project purposes and the online survey link. The parent survey was also advertised on the school website, with an easy-to-access link listed. Although the note went out to approximately 150 households, only seven survey responses from parents were received. The final surveys were given to community members in paper copy; they were hand delivered by students of R.F. Downey Public School during class time. Out of 120 surveys delivered, one was returned.

4. Results and Discussion

4.1 Challenges of Obtaining Results

Our results are based on the survey responses from students, staff, parents and community members as well as a focus group conducted with staff. The staff, parents and community member surveys response rates were very low, particularly the community member survey which had only one participant despite the approximate 150 surveys delivered to households in the neighbouring community. Table 2 provides more detail on the population and sample size for each survey. Although the staff, parent and community member surveys did not have large sample sizes, the student survey had a large participation percentage, as can be seen in Table 2. The student survey had a high response rate because their surveys were conducted in the classroom where all students were required to participate if they were in attendance.

Table 2- Survey Participation Rate

Group	Population Size	Sample Size	Percent of Population that Participated
Students	Approx. 200	182	91.00
Staff	Approx. 19	7	36.84
Parents	Approx. 150	7	4.67
Community Members	Approx. 150	1	0.67

The Ten Year Green Schoolyard Plan is based solely on the survey and focus group results. Although in the end we were able to get the information we needed to effectively create the Ten Year Green Schoolyard Plan, our surveying process would have been more successful and the results more reflective of the needs and wants of the staff, parents and larger community surrounding R.F. Downey Public School if the survey response rates would

have been larger. The lack of interest in participating in the surveys is disappointing not only for the success of our research, but also because it is indicative of a lack of community and parent engagement in school activities and an unwillingness of being involved with the schoolyard.

The original agreement with our host was to not only conduct an inventory of the current vegetation and gardening programmes, but also to do research on native plant species in the hope that the Ten Year Green Schoolyard Program would not only detail where and what type of vegetation to add, but also which species. Because of the extensive knowledge required of plants for the successful completing of this task, we were unable to meet our host's expectation of discussing and incorporating the distinctions of species into our research and the final Ten Year Green Schoolyard Plan.

4.2 Student Survey

On the days that surveys were conducted, the students who were in attendance were required to participate. All responses were anonymous and no names of students were recorded; only the number of boys and girls that were in the class were recorded as well as the grade level of the specific class being surveyed. As noted previously, the surveys consisted of the same questions for all grades from Junior Kindergarten to Grade Six. The survey was composed of both closed and open ended questions. Figures 6 to 8 show the findings from the closed ended questions.

Figure 6- Student Survey Question # 1

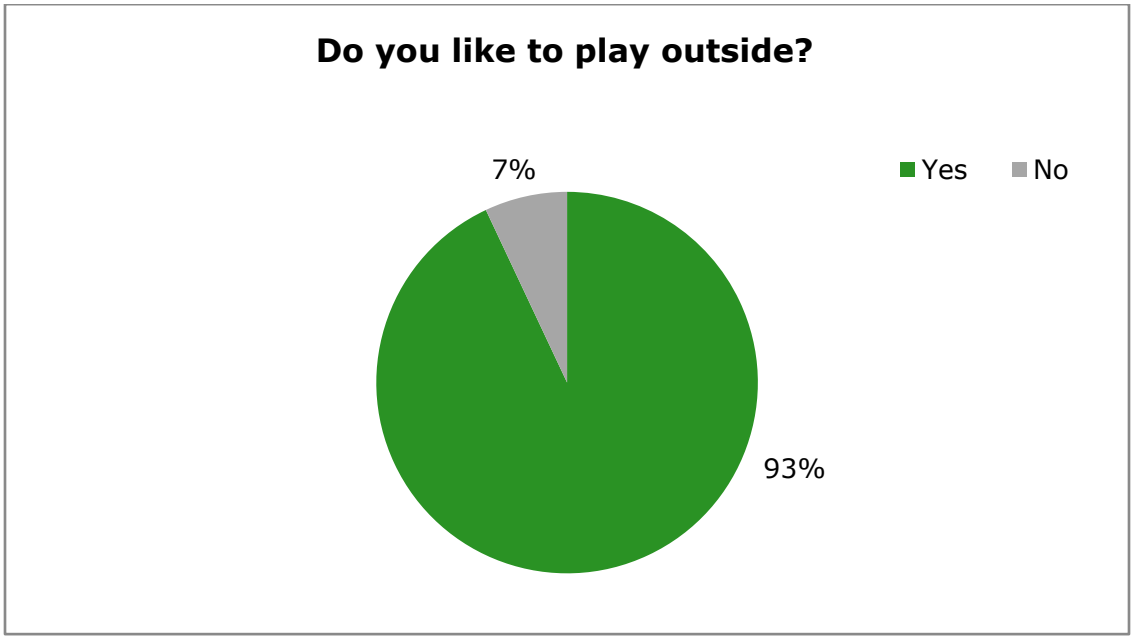


Figure 7- Student Survey Question # 5

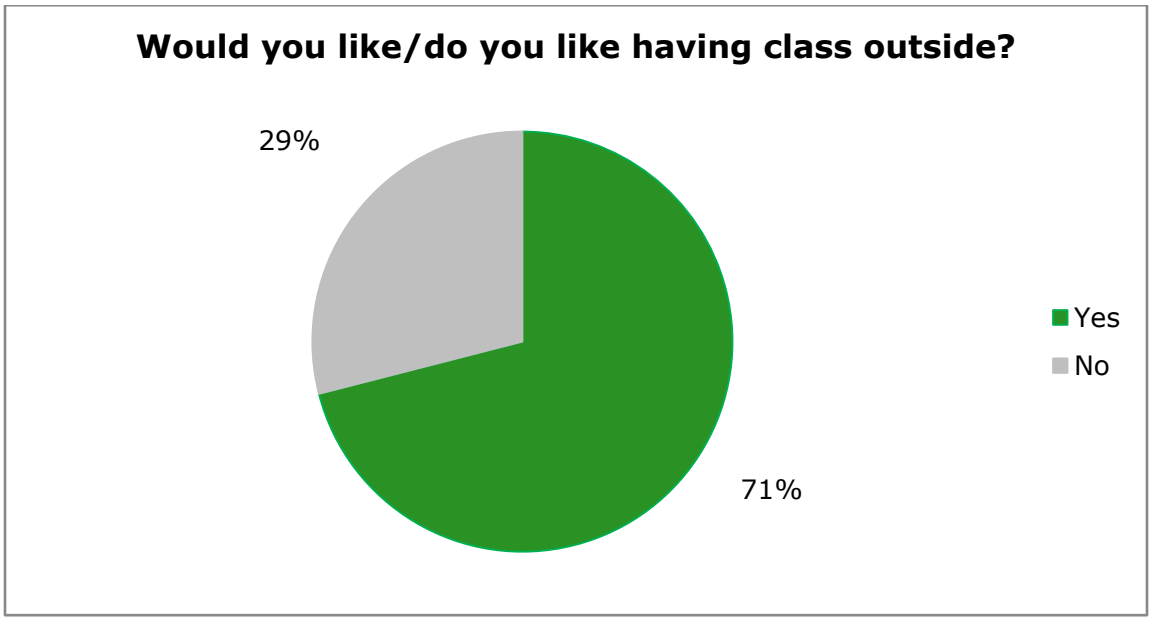
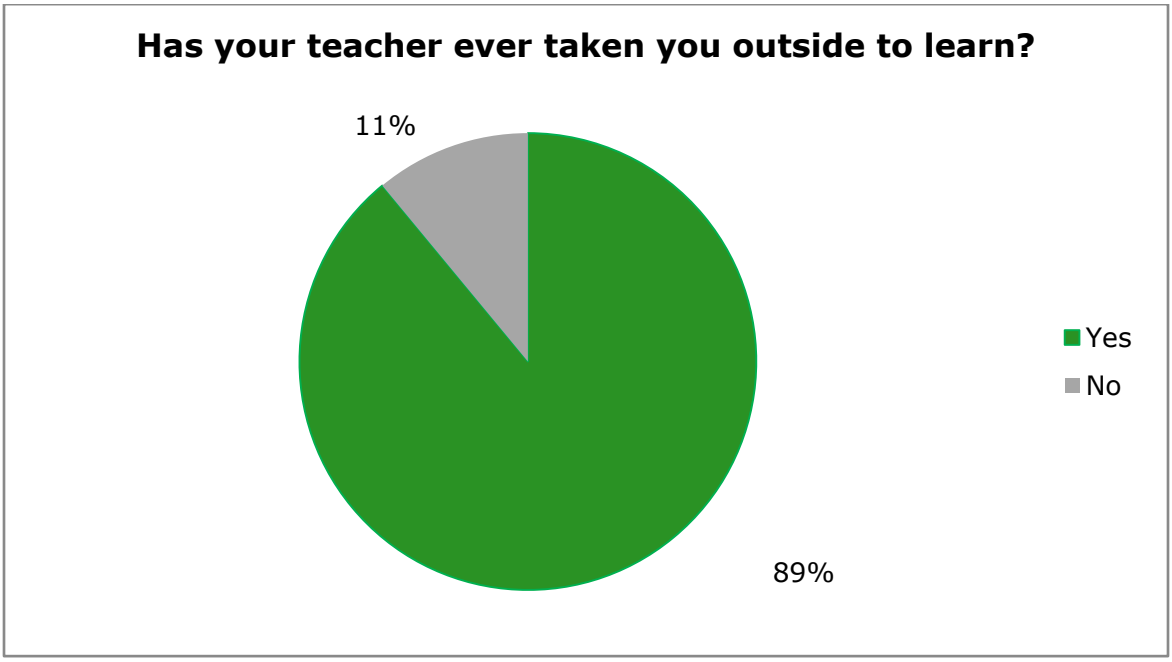


Figure 8- Student Survey Question # 7

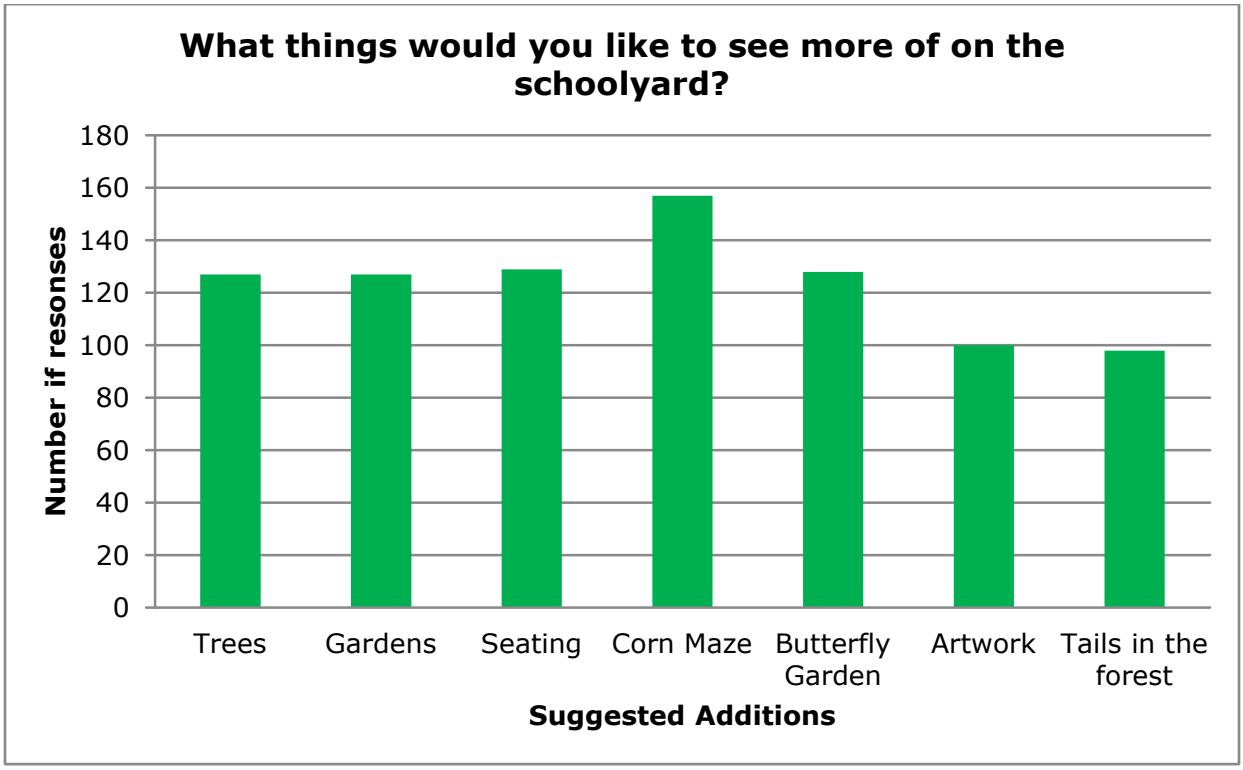


As demonstrated in the above graphs, a high percentage of students like to play outside and the majority are given the chance to learn outside. However, fewer students have a desire to learn outside or they do not enjoy the current way or what they are learning outside. Although we were unable to ask the students for clarification due to research ethics protocols, as researchers we have concluded through other observations that students are not being fully engaged in learning outside. Although their teachers may be taking them outside to learn, all students do not feel that they are learning about things they find interesting. At first glance it might be assumed that the survey data presented graphically in Figure 8 shows that students are being brought outside to learn and thus no further improvements are necessary on the schoolyard; however, for many, the only time they go outside to learn is for classes like gym. Our research shows that schoolyards are places for students to learn in all subjects; we would

like our Ten Year Green Schoolyard Plan to reflect this by eliminating the barriers teachers face in bringing their classes outside.

Also included in the survey were open ended questions that asked students for input on various things in relation to the schoolyard. The responses demonstrate that students use the schoolyard for a number of different types of activities, including sports and games. Their responses also indicate that students use almost every part of the schoolyard, their playground activities taking place at the following locations: pavement, hill, field, basketball court, grass, trees, sandbox, shade shelter, swings, monkey bars, forest, on ice, against wall. The answers also show that students are aware of the different types of animals and plants that they could find on the schoolyard. Although the answers are indicative that some classes are being brought outside to learn a variety of subjects, the students' answers also reveal that there are a number of other things that they would like to learn outside on the schoolyard. The students indicated a number of additional things they would like to have on their schoolyard (for more details see Appendix A: Raw Data). Figure 9 graphically represents some of the things students identified that they would like to have on the schoolyard in Question 11.

Figure 9- Survey Question # 9



From the student survey responses we have come to two conclusions. First, students have a desire to both play and learn outside. Second, the majority of students' teachers are taking them outside to learn but they are not necessarily learning about the things they want to learn about. As a result of these conclusions, the Ten Year Green Schoolyard Plan will incorporate additions to the schoolyard that will continue to encourage students' engaging through play as well as provide them with new innovative places to learn.

4.3 Staff Survey

The staff were given a survey consisting of six questions online via surveymonkey.com (see Appendix **B**: Ethics Proposal for a list of the questions). Out of a total of 19 staff, only seven participated. The reasons for this low response rate could have been related to a number of

factors, including that the staff who did not participate did not have access to a computer or internet, that they did not have time to complete the survey, or that they were not interested in being involved in greening the schoolyard activities. Out of the seven staff that responded, six said that they have taken their class outside to learn and one said they would be willing to consider doing it in the future.

When asked what they do when they take their class outside, some noted that they have taken their classes for nature walks, to learn about habitats, to read, to meditate, to do drama performances, to study insects in their natural habitats, to learn about gardening and healthy eating education and to learn about soil erosion. These responses demonstrate that a good portion of the staff are taking their students outside for a variety of academic and play activities. It cannot be concluded, however, that all staff take their children outside to learn; it could be that the remainder of the staff who did not participate in the survey are not interested in taking their students outside to learn. Further inquiries would have to be made, however, before a firm conclusion could be stated.

One of the most important questions asked in the staff survey was in relation to challenges staff faced that prevented them from taking their classes outside. Four out of the seven teachers noted that student behaviour was a major problem. This was because of the size of the schoolyard and the lack of ability to control students once they disperse. Another concern was expressed by a kindergarten teacher in relation to age. It was suggested that trying to teach 25 four year olds outside was a daunting task. Finally, other challenges included not enough shade, lack of curriculum content able to be taught outside and the additional preparation and planning required for outdoor lessons. When asking this question, our goal was

to determine why staff were not taking students outside. By understanding the challenges we hoped to be able to provide solutions within the Ten Year Green Schoolyard Plan that would address them.

After identifying these challenges, the next question asked was “What kinds of support could remedy the challenges you may have noted in Question 4?” Some suggestions included additional adult supervision and support (ex. having an E.A. there to help), administrative support, and prepared activities and resources for lesson planning. Finally, staff were asked what they would add to the schoolyard to make it better. Responses included shelter, rocks for seating, a wind-proof area, tables/game surfaces, slides built into the hill, manmade hills and above ground obstacles.

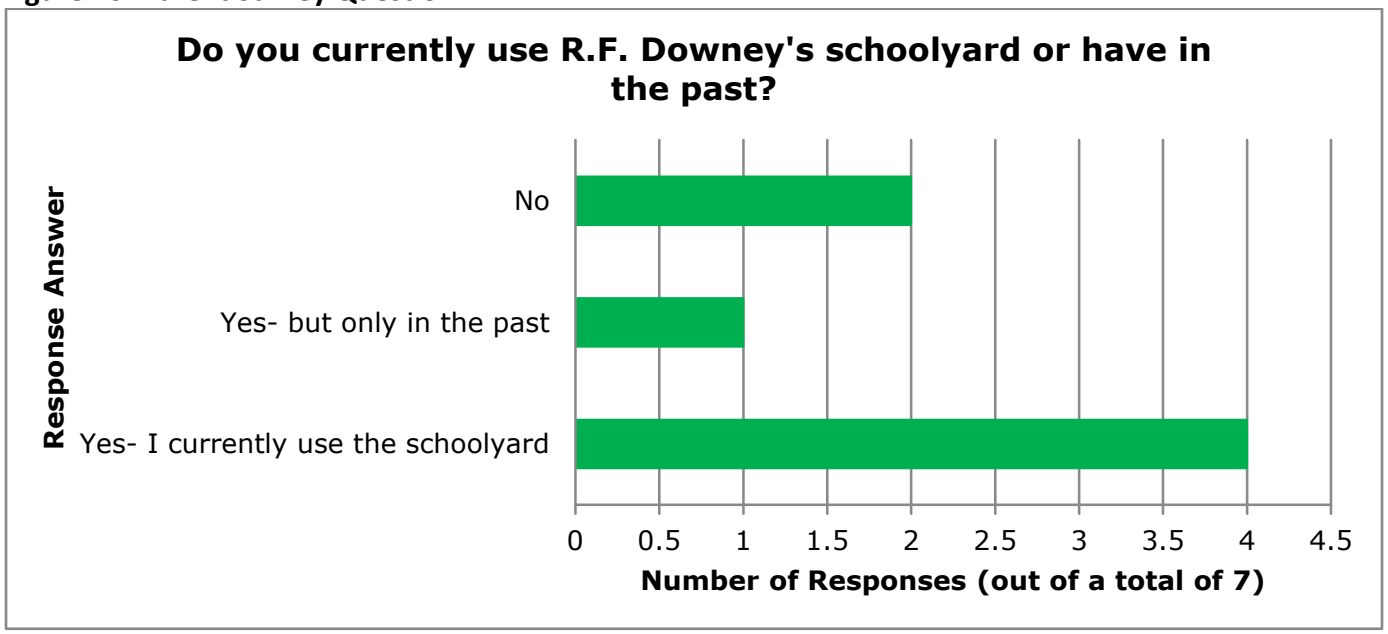
4.4 Parent Survey

Out of an approximate sample size of 150 households, we received a total of seven parent survey responses. Letters were sent home to the youngest or only child of each household explaining our project and asking for parents to participate in the survey online using surveymonkey.com (see Appendix B: Ethics Proposal to view the letter). The survey link was also posted on the school website homepage by our host, Emily Straka.

The staff survey asked a series of six questions, all qualitative. After answering question one, displayed in Figure 10, parents listed how they used the schoolyard. Most parents noted that they used the schoolyard after school when picking up their son or daughter, on weekends and in the past when there was play equipment to play on. Parents were also asked about problems or concerns they had about the schoolyard. They noted safety-the kindergarten play

areas are not fenced in, poor lighting at night and not enough equipment for children to play with. Suggestions that were made included more shade trees, more equipment for children to play on, moving the vegetable garden closer to the school, and adding a butterfly garden or shrubs to encourage birds. Out of the seven parents surveyed, one said they would be interested in being involved in volunteering with future projects.

Figure 10- Parent Survey Question # 1



From the parent surveys, it can be demonstrated that not a lot of parents want to be involved in developing the schoolyard further though they do use the schoolyard. This is important to recognize, as it could have consequences on the vision of having community gardens on the schoolyard, as discussed during the focus group. Thus, when developing the Plan we hope to take into account the parent concerns about safety but also ensure that not a lot of maintenance will be required, as the parent volunteer base seems low.

4.5 Community Survey

Community surveys were delivered to the surrounding homes located close to R.F. Downey Public School by a class of supervised students. Approximately 150 surveys were distributed and one survey was returned. The survey response outlined that the individual has used the schoolyard in the past, mostly in the spring and summer for the playground. Some of the concerns they listed included ice in the winter and the behaviour of students during recess including pushing and fighting because of non-visible areas. For resources, they suggested contacting the Peterborough Horticultural Society for gardening programmes grants. Finally, they suggested some improvements to the schoolyard including community garden plots; water collection bins/rain barrels to use to water the gardens; and more plants that feed birds and butterflies in a perennial garden. This response demonstrates that there is at least one member of the community enthusiastic about the schoolyard and willing to be involved in improving it. See Appendix B: Raw Data for the compiled answers for all the surveys. We have only discussed what most pertained to our research; the raw results of the surveys are thus attached to be used for further analysis and research.

4.6 Focus Group

The focus group was arranged in order to address certain questions and issues brought up in the surveys. The focus group was attended by six staff members, including three teachers, the secretary, an Educational Assistant, who was also a community member who participated in the online surveys, a supply Educational Assistant, and a co-op high school student. The initial question asked to the group was “What do you think is working well on the schoolyard right

now?" Group members agreed that the trees are a major focal point of activities for a whole group of students. This includes the cedar trees in the back of the schoolyard. Benches near the popular trees, the big oak, and in the kindergarten area, as well as the shade shelter, serve as primary 'gathering spots.' The students also spend a lot of time in the garden area and corn maze during the fall. The large sod bowls are also popular spots for students, encouraging them to engage in imaginary-play activities. They noted that during the summer when the students are not using them as much, the wasps built their nests there. It was suggested that a solution to remedy this problem would be to install fake wasp houses in the trees nearby.

The second question that was posed to the focus group was: "Many of you commented in the online surveys in wanting to take your class outside, and that you have taken them outside for various activities. However, some students said they want to learn outside more often. What are some of the challenges you face in taking kids outside. How can we overcome these challenges?" As was repeatedly mentioned in the staff survey, one of the greatest challenges is that the students 'go wild' as soon as they are taken outside. Suggestions to avoid this included adding seating, such as benches and rocks, to create an outdoor classroom; this would set clear boundaries for the students and encourage focus on the lesson. It was suggested that an appropriate location for this is within the semi-circle of trees that are located on the north part of the schoolyard near the corn maze. These trees would also provide shade to the outdoor classroom. Another suggestion was to create an additional circle of seating under the large oak tree. It was also mentioned that neighbors whose yards back unto the schoolyard complain of children having to continually retrieve soccer balls from their backyards. Planting trees on the southern border of the schoolyard or extending the fence are possible

solutions. Also, having pre-made resource bins with all the materials and activity instructions needed to conduct lessons on the schoolyard would make it a lot easier for teachers to have classes outside.

The question “Are there things that we can add structurally to the schoolyard that would help?” led the participants to engage in a discussion about the best placement of the school gardens. There was a suggestion to move the gardens closer to the school in order to address the concern of ‘the further you go, the more you lose them.’ In the end it was concluded that it would be better to leave the gardens on the northern periphery of the schoolyard where they are currently located; having the gardens not located in a central location would hopefully help prevent students from excessively jumping over them or throwing the produce around. The participants did not believe that the idea of putting a fence around the gardens to create a distinct ‘learning zone’ to be entered only with teacher supervision, as has been done at other schools, was suitable. They felt that it was important for the gardens to be used by students during recess and after school, as well as during class time, as this is when important ‘exploring’ takes place. Teachers will have to focus their efforts on educating students on proper behavior and dealing in regards to the gardens. It was generally agreed that an expansion of the gardens would be a good thing. This would ideally include community garden plots on the southern portion of the schoolyard. These community garden plots could be used by kindergarteners and their grandparents from May to September.

Another concern that was raised was poor visibility created by some the trees in the southeast corner of the schoolyard. A suggestion to make this space more open in order to increase visibility would be to create a habitat area that included trails. Wild grass seed could

be sown along with other low maintenance vegetation. Kindergarten gardens could be planted next to the habitat area which would help with increasing the usage of this corner of the schoolyard. When asked which other things could be included in the schoolyard in order to encourage interaction with nature, participants responded that small shade shelter in the primary area near the swings would be useful. Another line of cedar trees could be planted near the soccer field. Creating different types of gardens in the empty peripheral areas of the schoolyard, such as butterfly and xeriscaping gardens with plants from dry climates that would not require any watering, would give students an opportunity to engage with different types of vegetation. Another idea was to create a path all around the schoolyard; as this would be a large undertaken, the Plan could separate this goal over several years.

The participants all agreed that having more trees would be good; one participant noted that they create a more 'homey' and cozy atmosphere. They wanted to see a variety of native tree types planted and of different ages; this would ensure that the schoolyard would not lose all their trees at once to disease or old age. Deciduous trees would be most appropriate as the lower branches could be broken-off so that they would not obscure visibility. When planting trees along the edges of the schoolyard it is important to leave enough space for the lawnmower to pass between the trees and the fence. They hoped that the Plan would help them know what trees to buy and where to put them. The participants also wanted to different levels of rocks, stumps and bushes to be planted as they would promote the development of gross motor skills and encourage imaginative play. School Board restrictions prevent the rocks and stumps cannot be more than 17 inches off the ground. They also liked the idea of having a slide that is dug into the hill; this slide would meet the height restriction and could also be used

during the winter for tobogganing. Another suggestion was to install old tires into the ground that could be crawled through or crawled-on.

Participants also liked the idea of creating a hill similar to the one at Edmison Heights Public School located nearby; the hill would be ideal for tobogganing. There was also a general consensus in the focus group that a sandpit is a necessary addition to the schoolyard on the premise that 'if you don't give the kids sand to dig-in, they will dig in the dirt.' The biggest challenge that the school has faced with sandpits in the past is cats littering it. The participants suggested that in order to prevent this problem the sandpit design should include a cover. It would also be a good idea to have the sandpit under a shelter to keep the students protected from the sun. Another suggestion was to have boarders put around the garden and flower beds in an attempt to limit the growth of weeds; the vegetable garden borders should be made from cedar while the flower bed boarders could be made from pressure treated wood.

The last question that was posed to the focus group was: "When we speak of this Plan, what do you understand it to be and how can we design it so that it is most helpful to you?" It was explained to the group that one of our goals in creating the Plan is to make it as practical as possible. We were struggling to find a balance between giving very specific suggestions (such as, year one: build a shade shelter; year two: plant ten trees on the southern border of the schoolyard) and being general enough to allow for the flexibility needed when unforeseeable opportunities arose, such as a community member offering to donate rocks or stumps for seating. The participants agreed that they would like the Plan to be as simple as possible and so that it would also be applicable to community volunteers during the summer. The participants also suggested that the Plan should take into account the fact that volunteer levels will

fluctuate greatly. One of the most important things that the participants wanted included in the plan is not only what should be added to the schoolyard, but where it should be put. In this way, when unforeseen opportunities arose, such as the community member dropping-off rocks or stumps for seating, they would know exactly where to put them. Table 3 outlines the suggested improvements and their locations made during the focus group.

Table 3- Suggested Improvements to the Schoolyard

Improvement	Location
Fake wasp houses	Near sod bowls
Outdoor classroom with seating (rocks or benches)	Under semi-circle of trees
Circle of seating	Under oak tree
Trees/extend fence	On South border of schoolyard
Expansion of gardens	Current location
Community gardens	In Kindergarten area near habitat
Habitat area with trails	South-eastern corner of schoolyard
Shade shelter	Primary area near swings
Line of cedar trees	Near soccer field
Butterfly and xeriscaping gardens	Periphery of schoolyard
Path surrounding schoolyard	Southern and Western border
Native and diverse trees	Along edges of schoolyard
Adventure area- rocks, stumps, tires (< 17 inches)	
Sandpit with lid (under shelter)	
Hill	
Slide dug-into hill	
Borders around gardens and flower beds	Gardens and flower beds

4.7 The 'Ten Year Green Schoolyard Plan'

A separate document of the Ten Year Green Schoolyard Plan was created. See Appendix F: The Ten Year Green Schoolyard Plan.

5. Conclusion

5.1 Summary of Key Findings

Though we were not able to include a more specific and finalized Ten Year Green Schoolyard Plan for R.F. Downey Public School, our research and basic plan has given the staff, students, parents and community members associated with the school the tools to plan for the future. We have taken the first step into making R.F. Downey Public School a greener place. With this research, the school can work together to get motivated and inspired to do anything they want within the schoolyard, even ideas outside of the Plan's suggestions. We have demonstrated the benefits of school gardening programmes and provided examples of what have been included in other programmes in hopes of starting the brainstorming process for future projects.

Our project had the following two research goals:

1. To develop an inventory of current plants, trees and greening programmes already established at R.F. Downey Public School.
2. To create a Ten Year Green Schoolyard Plan with specific outcomes and goals established by the host (Emily Straka) and researchers (Kristin Boyd and Julie Gardner).

A literature review was conducted to discover the benefits of green schoolyard programmes, as well as to examine other greening programmes that have been established at other schools. This revealed that green schoolyard programmes allow students to develop a relationship with the natural environment and teaches them about sustainability. Having the outdoor natural environment part of childhood development contributes to their awareness

consciousness of how their actions impact themselves and the environment (e.g. eating more vegetables, recycling more etc.) during their youth and adult life. As well, students' academic performance also benefits with the inclusion of greening programmes during class time as they are not only known to reduce behavioural issues but also engage students in a diverse learning environment.

Surveys were conducted with students, staff, parents and community members of R.F. Downey Public School. A focus group was also held with staff to review and elaborate the issues they brought up in their survey responses. Overall survey response rates were low but the information gained was valuable. The responses that detailed what should be added and improved in the schoolyard were used to create the Ten Year Green Schoolyard Plan.

The Ten Year Green Schoolyard Plan was created with maps and tables to suggest future projects for R.F. Downey Public School's schoolyard, detailing when and where they should be implemented. The suggestions were not described in detail, leaving space for interpretation and allowing the school to make any adjustments as needed as the situation of the schoolyard and those involved change with time.

5.2 Research Limitations

Within our research we experienced several limitations. First, due to ethical concerns regarding vulnerable sectors, our ethics process took longer than expected. The questions we had hoped to ask as well as the way the surveys would be conducted brought confusion to the ethics committee. In order to finally gain approval, we had to request a letter from the school principal stating that the staff of R.F. Downey Public School would be surveying the students and not the researchers. Once the ethics committee was confident that we would not have any

direct contact with students, we gained approval to begin conducting the surveys. The re-submission process delayed our ethics from getting approved for almost four weeks which put us behind in our schedule. The slowness of the process was largely due to our lack of knowledge of ethical concerns in relation to vulnerable sectors.

Once surveys were distributed we ran into our second limitation; receiving responses. Although we had worked hard to ensure that all ethical standards we being followed, we were not receiving many responses from parents, staff or community members. In the end, less than five percent of the parents and community members responded to the surveys. Therefore, the Ten Year Green Schoolyard Plan is based upon only a small percentage of data that does not represent the majority of the parent or community member populations.

Along with the lack of survey responses, we found it difficult to interpret the survey responses we had. In the staff surveys, one participant wrote that there was not enough space within the response box given to discuss what challenges they faced on the schoolyard. The parent survey responses were short and at times answers were not explained. Finally, student surveys were the most difficult to interpret because they were handwritten. The teacher who was asking the questions wrote the responses on the chart provided. However, for some classes responses were left blank. For example, in the question “What things would you like to see more of on the schoolyard” some charts had numerical data whereas others had comments. Thus, not only were we left with inconsistency in survey delivery and responses, but we were unsure of some class’s thoughts on questions. In order to remedy this process in the future, clearer directions in terms of survey delivery should be given to the teachers.

The final limitation we faced was the lack of knowledge, experience, and familiarity as researchers with creating schoolyard plans. From the beginning it was very challenging to understand how specific the Plan should be and what should be incorporated in it. Also because of our lack of experience in gardening and landscaping, we felt that our suggestions for placement of trees or hills or anything else was simply based upon what was suggested in the focus group and our personal thoughts while doing the research, rather than grounded in thorough understanding of the outdoor space. Thus, when creating the Plan, we were limited as to what we could include for lack of knowledge and lack of time remaining to finish the project.

5.3 Suggestions for the Future

It is important to note that the greening process of R.F. Downey Public School's schoolyard is far from complete. Our research project was just the first step into helping R.F. Downey Public School work towards creating a culture of sustainability at their school. After reflecting on the research process as a whole, we have three suggestions for the future.

First, in order to ensure that the Ten Year Green Schoolyard Plan is implemented and put into action, we suggest another TCCBE project for next year. Having students who are more knowledgeable in gardening that would be able to effectively research information about native and non-native species to be added to the Ten Year Green Schoolyard Plan would be useful. Also, these students could help search for funding options to assist the school in reaching the green schoolyard goals outlines in the Plan. Using the Plan as a guide, these research students could assist the school in working towards the specific goals; this would allow

for quicker results, giving R.F. Downey Public School encouragement and keeping the enthusiasm about the schoolyard going. Our research has shown that many schools with successful green schoolyard programs have established a core group, made up of staff, parents, students, and community members, who are responsible for the schoolyard's programs. The students can also help with setting this up, if it has not already been created by the teachers.

Secondly, it would be extremely beneficial to have another TCCBE project based purely on curriculum content. As Concurrent Education students, we wanted to try and incorporate some of the curriculum into our Plan. Although time did not permit this, we still feel that it is a valuable component. Since academic performance is greatly influenced by outdoor classrooms we feel this would be a great project to be undertaken. In our focus group, one teacher suggested having bins created with materials for a specific grade and lesson that would be ready for a teacher to use. This would reduce the amount of preparation time needed to take a class outside, helping to alleviate an important barrier preventing teachers from taking their classes outside to learn.

Our final suggestion relates to the amount of time spent in class. As research students, this was our first experience doing something academic that did not require us to attend all classes. From our experience, we felt that the time we were not required to attend class was not used valuably. Thus, for future students we suggest using the designated lecture time on weeks when there is no lecture to work on the project every week. This will reduce the amount of time spent rushing to get things done by the deadline.

There are numerous resources available that deal directly with green schoolyards; many of which give very helpful and specific suggestions. One's search should start with the Internet,

as there are many websites available that provide useful tips as well as link to resource documents. See the annotated bibliography in Appendix D: Proposal for a description of some of these many websites. Magazines available at Trent University's Bata Library, such as *Green Teacher,* also provide useful information about green schoolyards. Included below is a small list of books where one can start their research. All of these resources can be found in Trent University's Bata library or are available through Trent University's inter-library loan system, Racer. These include:

- Bucking-Sporer, A.B., & Pringle, R.K. (2010). *How To Grow A School Garden: A Complete Guide for Parents and Teachers.* London: Timber Press.
- Broda, H.W. (2007). *Schoolyard-Enhanced Learning: Using the Outdoors as an Instructional Tool, K-8.* Portland: Stenhouse Publishers.
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5.4 Final Summation

Overall, we greatly enjoyed participating in the Community Based Research Education process and felt that it was a valuable experience and important addition to our undergraduate educations. The input received from the surveys and focus group revealed that there are passionate environmentalists at R.F. Downey Public School. Although our research has only provided the school with a basic vision for the future, we hope that further research, combined with 'grassroots' initiatives on the part of stakeholders at the school, can be conducted to continue this process. We were able to complete our objectives academically and we hope that R.F. Downey Public School can use this Plan to enhance students' play, behaviour, academics, but most importantly, create in them a deep appreciation and respect of the natural environment which sustains them.

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7. Appendices

Appendix A: Raw Data

STUDENT SURVEY- Open Ended Questions

3. What games do you like to play outside?	Tag (x8), soccer (x8), hide and seek (x6), basketball (x5), octopus (x4), survivor (x4), swings (x4), manhunt (x4), monkey bars (x4), swings (x3), 4 square (x3), hockey (x3), mini sticks (x3), wall-ball (x3), football (x3), racing (x2), baseball (x3), skipping (x2), hopscotch (x2), capture the flag (x2), freeze tag, transformers, skate ice, superheroes, hot potato, power rangers, running fast, hockey, snowball fights, make igloos at home, swings at park, ride bike, go beach, skateboard, catch ladybugs, go to beach, swimming, Tiger (role play), catch, sonic, fairies, huskies, dogs/cats/birds, rest and peace, handball, snow buddies, sharks and dogs, star wars, angry bird, invisible pet, saints, row 2, toilet tag, snowman, gold, TV tags, wander around the schoolyard- like large trees, run around, at house use scooters and bikes, swimming, man-tracker, cats, swat, make believe games, spider web tag, mind craft (make-believe game based on a video game), imagination games like house, British bulldog, all sports and most games we need more equipment those
4. What things do you play with on the schoolyard and where do you play them?	Four square on the pavement, crazy carpet on the hill, soccer in the field!!!!, manhunt all around the school, British bulldog and soccer at the field, ministicks on the pavement outside, baseball at the diamond, manhunt everywhere, basketball at the basketball net, ministicks on the pavement, football on the hill, soccer beside the shade shelter, football up on field or hill, soccer ball beside shade shelter, soccer- field, ministicks on pavement, soccer ball in field, football on the field, soccer ball on soccer field, ministicks everywhere, wall-ball anywhere, manhunt all around the schoolyard, soccer and British bulldog on the field, basketball at the court, ministicks on the pavement, soccer- field, basketball- court, Trucks on the grass, balled on the pavement, games like tag on grass on the playground, all around, on the hill, hid and seek in the trees, starwars (on pavement), tag, dig in sand, skipping ropes, plasma cars on pavement, toys in sandbox, lay on the grass, swings, balls, octopus, what time is it Mr. Wolf, red rover- kindergarten yard, spy-anywhere, build snowcastles in field, basketball on pavement, octopus with Dana behind shade shelter, snow towers, many people don't build snow sculptures because kids wreck them, Hide and seek at shade shelter, tag behind swings, octopus tag behind shade shelter, zombie tag near monkey bars, star wars- everywhere, spies- all over yard, slide ice, ninjas on hill/everywhere, swings, monkey bars, slides and ladders, football (in soccer field), rope for a leash (play anywhere), adventurers (on hill), snow cat (on hill), tobogganing (on hill), hide and seek (all around), near big tree (star wars), swings, 4 squares on pavement, Pokémon on ice or everywhere, mini-sticks on pavement, octopus on wall, rolling down hills, tobogganing, on hill, play hide and seek

	around the trees, monkey bars, play in forest, behind shade shelter, play soccer, four square ball- tarmac, kick small rock-on grass, write words with rocks- on pavement, cones for octopus- open field, basketball and net- big court, mini-sticks, 2 nets, tennis ball- open pavement, soccer ball, net or cones- open field/soccer field, bat, helmet, baseball, bases, gloves- baseball field, hide and seek- bushes/hedges, swings, monkey bars, tetherball, basketballs (court), wall-ball (flat-no windows), soccer/football on fields, balls- on field, against wall, on pavement, skipping rope-pavement, swings- monkey bars	
5. What kinds of animals, insects, plants and tree types can you find in your schoolyard? Name all that you know.	Caterpillars (x9), bees (x9), pine trees (x8), ladybug (x8), maple tree (x8), butterflies (x8), flies (x7), worms (x7), squirrels (x7), chipmunks (x6), birds (x6), sunflowers (x5), skunk (x5), ants (x5), grasshoppers (x5), spider (x5), beetles (x4), seagulls (x4), apple tree (x4), robins (x4), flowers (x4), blue jay (x3), snakes (x3), cricket (x3), tomatoes (x3), tulips (x3), black eyed susan (x3), frog (x3), praying mantis (x3), chickadees (x3), mosquitos (x3), rhubarb (x3), dandelions (x3), cedar (x2), beans (x2), oak (x2), insects (x2), crab apple (x2), poplar (x2), wasp (x2), lettuce (x2), trees (x2), grass (x2), crows, dogs, woodpeckers, fox tracks by swings, cocoons, violets, pokey plants, roses, blue and black, corn, daisies, daffodils, momming doves, wasps, tomato bugs, dragon flies, fruit flies, stink fly, stick bug, palm trees, white flowers, clover, Christmas tree, big tree, cherry tree, rabbit, fox, cat, black widow, bush, carrot, cauliflower, zucchini, spinach, sunflower, trillium, queen arms, lace, devil's paintbrush, willow, beech, cherry, evergreen, grubs, toads, sumac, big tree with the benches, new trees ("don't know the names"), 'fuzzy tree' in habitat, peppers, corn maze (before it was trampled), vines, bumble bees, vegetables, peas, nut trees, cherry tree, flower garden, slugs, spitting bug, vegetable garden, mouths, hornets, plants, no idea,	
7. If your teacher has taken you outside to learn….	**a.) where did you go?** On the pavement facing the small hill and we were throwing balls up the hill while learning muscular force, gym, we learned how to play baseball and saw insects and nature, not here but at my other school we went outside to learn more about trees and plants, we would write down about how they're changing in the fall, sports we learned how to play soccer and baseball, we learned how to play soccer, baseball, we took little clay parashoot men outside and tested if they would work! they did!, I learned about the outdoors, gardening, nature, sports, nature, about the garden, insects, animals, we didn't ☹, the garden and how to make a tree, big kids yard, Forest- saw plants/squirrels, learning about planting flowers- butterfly garden, dig out potatoes from garden, at baseball field- looking for stuffed snake, found nature, hill- learn about leaves (different kinds), gym-do push-ups- learned to keep back straight, went on hill to look at different leaves and then did rubbings-maple leaf, went warsaw caves- animal	**b.) what did you learn about?** Looking for types of leaves, butterflies, Muscles, French, nature, planting/growing, littering, listen to stories, physical education, life cycles- weather, language activities, drama, music, gym, team skills, cooperation

	tracks, crayfish swap, how bugs build a home, on hill, in habitat- about nature, in habitat- about trees and plants, in habitat to clean up, garden- learned about veggies, plant in garden, tarmac, hill, garden, outside for gym, cornmaze, bench, schoolyard, playground, habitat, park, field	
10. What do you like/would you like to do or learn about if you have class outside with your teacher?	Learn more about nature, learn about gardening, the different plants, insects and that, different kinds of flowers, body parts of insects, plants and trees and weather and animals, how they live, and how serious the weather is and how things are made with the weather, bugs, bugs sports, nothing more, bugs, birds, sports, nature, nature I guess, trees, everything, gardens, Gym (play games), math (numbers), drawing, writing, colour, read, what kind of bugs there are, which bugs like in the dirty, why do bees collect nectar, why do they get beeswax/make hives, go on a bear hunt, picnic, learn about bugs, bring binoculars, camera, make snow-castles, look in big kids yard, responsibility, butterflies and other insects, More about nature, flowers, bugs and plants, about trees, insects, birds and other animals, insects, animal tracks, animal life cycles, learn how birds fly, play dick, duck goose, learn about nature, trees, about roots, different kinds of bugs, animals (everything), how wild cats live in the wild, all about nature, woodpeckers, what lives in the ground, how to keep your plants living, take care of a plant, life cycle of plants and animals, learn more about environment, how to plant more, hot to garden, where bunnies, environment, nature, playing, songs, animals, animal sounds, animal tracks, fossils, conservation, nature culture, just half class outside, music, nature walks, draw/write in habitats, photography, science- name the trees and learn about different plants, art- draw things outside, music- listen to birds and nature sounds, gym- more space to move (helps us when we feel restless), math	
11. What things you would like to see more of on the schoolyard?	Other Suggestions: More swings, trails, rocks to climb on, more sand, more bushes, more grass, blueberry bushes, strawberry, pear trees, worms for the garden, bunny rabbit, slide, swings (lower), monkey bars, slide in the ground, apple tree, pear tree, plants, statue, bird houses, homes for ladybugs, identification plaques, milkweed, picnic tables, rocks for climbing on and sitting, birdfeeder and bird bath, trees that bear fruit, more birds, vegetables, bugs, flowers, hummingbirds, a path for the toboggans, tire swing from big trees, blooming trees, posts for other soccer, sod nests, tree nursery, birch trees, clumps of cedar to make a fort, explore learn more about nature, hedge maze, bushes, fruit trees, more grass, habitat-place for animals to live, pathways, more black top, more fields, more hills, pond, flowers, stop the people from using our yard as a doggie toilet- I count 12 piles and 3 bags north west of swings alone, another sun shelter, new climber, more (soccer) balls, signs to tell public to stop and scoop for their dogs, thought sculptures on the forest trails would be nice	

STAFF SURVEY- All Questions

1. Have you ever taken your class outside to learn with the exception of Phys Ed? If so, please list what activities or lessons you have taught outside and where they were taught on the schoolyard.	• Nature walks, collect leaves; • habitats, reading, observational writing, meditation, dance, drama, music. Our yard, and next door soccer field and fence row; • Yes, reading - usually at the shade shelter; Science - schoolyard; Math – schoolyard; • no; • often for Science in the habitat and also for art in various areas around the playground including under the big Maple tree out back; • survey insects in a square of grass- Science -art- draw what you see- small to large -listening to nature - helped with the garden; • gardening so we can learn about healthy eating. I've also taken students out into the habitat to observe, record (written and drawn) observations of an area over time (fall, winter, spring). also taken students out to create a butterfly habitat, learn about soil erosion on school yard, learn about insects that live in various areas around yard.
2. Would you be willing to take your class outside to learn in an outdoor classroom? Why or why not.	• Yes, it would be cool for students to learn in another environment and learn about the world around them; • Yes- too small a space to articular why; • Yes- our kids are not outside enough; • I would be willing to consider it. It would be interesting to see how a different environment would impact student learning; • absolutely but share and sun areas are a must!; • yes; • yes, I like to take students outside but it can be difficult because students don't always listen when you take them outside. They think it's just time to play and they run off. It's harder to keep them on task and confined to a certain area. they are more easily distracted and harder to keep on topic.
3. What in the curriculum do you think could be taught outside?	• Science, phys ed; • In all honesty, everything; • all subject areas; • science, art/drama/music; • science, art, drama, dance- ending connections to the outside; • science, art, language; Science (diversification, living things, life cycles, weather), language (writing about what you see, poetry, conncecting with the natural world so you can write about it), art (natural art, variety of colours, use natural items to create art) , phys ed.(getting fresh air, having more space to move, learning to enjoy variety of activiies in the seasons, keeping active through gardening) health (exercise and nutrition, mental health - cooperatiing with others, problems solving, relieving depression, get sense of accomplishment and improved self esteem), math (patterning, measurement, numeration - counting- data management,)

4. What are some challenges preventing you from bringing your class outside?	• Behaviour; • behaviour, lack of focus or rather lack of tie to teach that type of focus; • not enough shade on hot days; • age (kindergarten teacher); • mostly behaviour- taking children outside that I cannot count on to stay with me; • distractions for students- ideas to match curriculum; • Sometimes you can't think of what you can do outside with a class, or it takes too much time to plan different activities outside. some students complain a lot when they're outside and won't stay with the group. It's easier to do activities with a smaller group but not a full class. Challenges also include the board of ed. focussing on language and math testing and that makes it challenging to find time to take kids outside when it might be viewed as just playing. students with behaviour problems. If you're outside and a student gets upset or refuses to do something and just takes off, you're on your own and have to send a student inside to get help., some students don't stay with the larger group when you're outside.
5. What kinds of support could remedy the challenges you may have noted in question 4?	• Another adult, interesting/interactive activities for students; • administrative acknowledging the importance of outdoor experiences; • shade shelter/seating areas; • experience. I believe if I did it on a regular basis and showed the students the behaviour I expected, they could learn to behave properly outside; • if you have the answers I would be impressed- more adults of course!; • lesson plans to correlate with curriculum for specific grades; • I have heard that other schools have bins that are ready for various subjects and have everything that is required for a lesson in a particular area. so, for a measurement lesson, it would have a lesson plan, measurement devices needed for the lesson, recording sheets etc. so a teacher only needs to pick up the bin and go outside. They don't have to start thinking about how they can incorportate the outdoors, a bin of magnifying glasses that can be used for observing smaller insects on grass, in trees etc. We really need to have a variety of lessons planned so we can then just do it and not have to rethink how we could do something outside, it would probably help to have an extra walkie talkie for a teacher to take out in case of behaviour difficulties etc.,
6. What could be added to the schoolyard to encourage learning outside?	• Large rocks (for sitting on – maybe in a circle so you could do lessons with all students looking at you)- shade shelter with seating; • more wind proof areas if possible; another shade shelter/more gardens/benches/play areas/seating areas; • more wind proof areas if possible; another shade shelter/more gardens/benches/play areas/seating areas; • seating/workspace (tables); • two way communication systems; • don’t know;

	• benches / seating area for a class to be contained for instructions / discussions, shaded areas where students can sit and observe nature, I would like to see an area where students can sit at tables and talk/play cards or other creative games on a surface (ie - small table/surface with 4 seats around it that can't be moved or vandalized), It would be great to make use of the natural features of the school yard (a few small inclines that could encourage gross motor development (ie - slides built into a hill that can be used in any weather that you just walk up the grass to get to the top, stumps or rocks that are placed in an area that provides various sized circles for discussions or imaginative play or even gross motor development (like walking around on these various surfaces that are natural and encourage balance, eye foot coordination)

PARENT SURVEY- Open Ended Questions

2. If yes, please list usages below:	• When dropping off and picking up son; • my three children attend school; • on the weekends to swing play or slide; • we used to use wooden playground equipment before it was torn down. We also rode bikes on cement, and played wall ball; • as an outdoor play area after school hours
3. Do you see any problems/concerns with the current conditions of RF Downey's schoolyard? Please identify below.	• More shade trees would be nice, vegetable garden closer to the school; • no; • children need more and equipment to play on; • the ice and mud are a bit messy, poor lighting at night; • there isn't very much for kids to do. Could use flowers and such; • the kindergarten play area is not fenced in and needs to be for the children's safety. • no
5. Do you know of any resources available for funding or materials that would be beneficial for future projects? If so, please list below.	• Can purchase trees through Evergreen Canada, small scale habitat projects through MNR's Community Fish and Wildlife Involvement Program; • No
6. Do you have any suggestions	• More trees and shade areas for kids, butterfly garden or shrubs to encourage birds would be nice;

of what you would like to see on the schoolyard?	• more trees for shade; • more play equipment maybe even a pool if the city would build it and share ownership with the school board. The School board could charge an entrance fee, create jobs for teens attending KPDS; • rink for the kids in the winter as part of gym or recess would be fantastic. Anything to promote physical activity!

Appendix B: Ethics Application

TRENT UNIVERSITTY
Department of Geography
Peterborough, Ontario, K9J 7B8
Tel: (705) 748-1001 ext. 7686, Fax: (705) 748-1205, E-mail: geography@trentu.ca

HUMAN RESEARCH ETHICS APPLICATION

Synopsis:
We will be conducting surveys with three different groups: community members, parents, and teachers. The details, including method of administration, consent statements, and survey questions, are included below for each group. Please note that the informed consent of participants will be obtained through a disclaimer implying consent. This will be located either on the cover letter or directly on the survey depending on the group.

RE: Concerns brought forth by the Ethics Committee as to 'vulnerable populations'
We have restructured our ethics application to indicate that teachers will be the subjects, not the students. The host teacher will use her professional judgement when working with the students to receive their opinions on the schoolyard; any feedback that we get about students' opinions will come from the teacher directly.

Thanks,
Julie Gardner and Kristin Boyd

COMMUNITY MEMBER SURVEY

This survey will be printed on R.F. Downey Public School letterhead. It will be distributed to community members in the neighborhood surrounding the school by the host institution.

Community members will be asked to complete the survey and return it to the office at R.F. Downey Public School.

The survey consists of two pages:
-One-page cover letter introducing the project, researches' contact information, and a disclaimer implying the participant's consent;
-One-page volunteer contact information from which will be kept by RF Downey and not seen by the researchers;
-One-page survey.

PARENT SURVEY

This survey will be printed on R.F. Downey Public School letterhead. It will be distributed by the host institution to the children to give to their parents. Parents will complete the survey online using surveymoney.com. There will also be paper copies available at the R.F. Downey office for convenience.

The survey consists of three pages:
-One-page cover letter introducing the project and containing the researches' contact information;
-Two-page survey available online data collection website called surveymonkey.com; no personal information will be collected and the participant is asked for consent on a disclaimer located at the beginning of the survey

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TEACHER SURVEYS

The teacher surveys consist of:
a.) Teacher Survey- Staff
- **-survey for the teachers themselves to complete**
- **-they will receive the invitation to participate in the survey via email**
- **-the survey will be completed online via surveymonkey.com (an online data collection website which requires no personal information to be collected)**
- **-follow-up focus group interviews will be arranged based specific issues brought up in online survey results**

b.) Teacher Survey- Students

-one recommended surveys for the teachers to administer with their class, (these surveys are designed as guidelines for the teacher; using her professional judgment, she may choose to alter them)

LETTER TO COMMUNITY MEMBERS

R.F. DOWNEY PUBLIC SCHOOL
1221 Neptune Street, Peterborough ON
705 742-720

KAWARTHA PINE RIDGE
DISTRICT SCHOOL BOARD

Dear community members and friends of R.F. Downey Public School,

As you may know, over the years teachers and staff at R.F. Downey have been working to beautify the schoolyard in order for students to play and learn better. With help from two research students from Trent University, R.F. Downey Public School is developing a Ten Year Green Schoolyard Plan in hopes of making our green schoolyard program more sustainable. This plan involves the maintenance of the current community garden located on the R.F. Downey schoolyard, as well as the introduction of more gardens and plant species and green schoolyard programs.

Involvement and support of community members in this initiative is crucial to its success and sustainability. A survey has been developed in order to identify interested community members surrounding R.F. Downey who would like to be involved in the development of the project and advancement of the schoolyard.

Please return the completed survey to the office at R.F. Downey Public School.

If you have any questions regarding the project, please feel free to contact the researchers. Their contact information is as follows:
Julie Gardner- juliegardner@trentu.ca
Kristin Boyd- kristinboyd@trentu.ca
The researchers may also be reached through the Geography Department at Trent University.

By completing the following survey, I understand and agree to the following:

1. My participation is entirely voluntary. I may refuse to answer any and all questions.
2. No personal information is required and surveys are anonymous. All data collected will be used for developing the Ten Year Green Schoolyard Plan for RF Downey Public School and discussed in a report written by the research students.
3. Personal contact information data collected from those who wish to volunteer will be kept separate from the survey information.
4. Survey information will be kept separate and no names will be identified in the survey information.
5. The data from the survey will not be used for any commercial purposes and will be strictly used for the advancement of research.
6. The information will be stored responsibly.
7. Any risk to your participation in the project are unforeseen by the researchers.
8. If you have any questions, you can contact the researchers through RF Downey Public School Staff, which will then be transferred to the researchers as needed.

CONSENT FORM FOR VOLUNTEERING- kept in office of RF Downey & not used for research

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VOLUNTEER INFORMATION CONTACT FORM

By signing below, you acknowledge that you would like to be contacted by the staff of RF Downey Public School in helping with future projects for the Ten Year Green School Yard Plan.

How would you like to be involved? Please circle all that apply.

a. Interested in having/being involved in community gardens
b. Interest in helping maintain the greening programs in the summer months
c. Can donate trees, rocks, logs, plants and other materials useful for the schoolyard
d. Interested in being a regular volunteer in schoolyard projects throughout the year

Do you have any expertise or skills (e.g. gardening, outdoor education, environmental education, construction experience, etc.) that you would be willing to use to contribute to projects? If so, please list them below.

_____

_____

_____
Full name- please print

_____ _____
Signature Date

COMMUNITY MEMBERS SURVEY- distributed on paper to surrounding houses (no personal information collected)

COMMUNITY MEMBER SURVEY

Please note: if you are parent/guardian of a child who attends RF Downey Public School and have already completed our parent survey, please abstain from participating in this community member's survey.

1. Do you currently use RF Downey's schoolyard or have in the past?
    a. Yes- I currently use the schoolyard.
    b. Yes- but only in the past
    c. No

2. If yes, please list usages below:

    _____

3. Do you see any problems/concerns with the current conditions of RF Downey's schoolyard? Please identify below.

    _____
    _____

4. Do you have an interest in being involved in future initiatives in greening the schoolyard at RF Downey? Please circle one.
    a. Yes - please complete attached form and return it to RF Downey Public School
    b. No

5. Do you know of any resources available for funding or materials that would be beneficial for future projects? If so, please list below.

    _____

6. Do you have any suggestions of what you would like to see on the schoolyard?

    _____

LETTER TO PARENTS/GUARDIANS

R.F. DOWNEY PUBLIC SCHOOL
1221 Neptune Street, Peterborough ON
705 742-720

KAWARTHA PINE RIDGE
DISTRICT SCHOOL BOARD

Hello parents/guardians of RF Downey Public School!

As you may know, over the years teachers and staff at RF Downey have been working to beautify the schoolyard in order to better facilitate students playtime and learning. Mrs. Straka and the staff of RF Downey have sought help to develop a Ten Year Green Schoolyard Plan for RF Downey in hopes of developing better greening practices while adding to our current schoolyard gardens and plant species. Research has shown that greening practices and schoolyard gardens are beneficial as they help to improve the behaviour of students, promote hands-on learning which increases test scores and academic performance, reduces peer conflicts, and increases nutritional awareness which in turn, reduces risks of cancers and cardiovascular diseases later on in life. Involvement and support of parents in this initiative is crucial to its success and sustainability. Student input is also vital for the development of the plan. Two research students from Trent University have volunteered to help our school community develop this project and we are asking for your input.

If you would like to provide input that will be used to help develop the Ten Year Green Schoolyard Plan, please take ten minutes to fill out the survey at the following link:

www.surveymonkey.com/s/RBC92HM

If you would prefer to complete the survey in paper format, a copy may be requested at the R.F. Downey office.

If you have any questions regarding the project, please feel free to contact the researchers. Their contact information is as follows:
Julie Gardner- juliegardner@trentu.ca
Kristin Boyd- kristinboyd@trentu.ca
The researchers may also be reached through the Geography Department at Trent University.

PARENT SURVEY- using anonymous online survey engine

PARENT SURVEY

By completing the following survey, I understand and agree to the following:

1. My participation is entirely voluntary. I may refuse to answer any and all questions.
2. No personal information is required and surveys are anonymous. All data collected will be used for developing the Ten Year Green Schoolyard Plan for RF Downey Public School and discussed in a report written by the research students.
3. Survey information will be kept separate and no names will be identified in the survey information.
4. The data from the survey will not be used for any commercial purposes and will be strictly used for the advancement of research.
5. The information will be stored responsibly.
6. Any risk to your participation in the project are unforeseen by the researchers.
7. If you have any questions, you can contact the researchers through RF Downey Public School Staff, which will then be transferred to the researchers as needed.

---

1. Do you currently use RF Downey's schoolyard or have in the past?
    a. Yes- I currently use the schoolyard.
    b. Yes- but only in the past
    c. No

2. If yes, please list usages below:

_____

3. Do you see any problems/concerns with the current conditions of RF Downey's schoolyard? Please identify below.

_____

_____

4. Do you have an interest in being involved in future initiatives in greening the schoolyard at RF Downey? Please circle one.
    a. Yes
    b. No

5. How would you like to be involved? Please circle all that apply.
    a. Interested in having/being involved in community gardens
    b. Interest in helping maintain the greening programs in the summer months
    c. Can donate trees, rocks, logs, plants and other materials useful for the schoolyard
    d. Interested in being a regular volunteer in schoolyard projects throughout the year

6. Do you have any expertise or skills (e.g. gardening, outdoor education, environmental education, construction experience, etc.) that you would be willing to use to contribute to projects? If so, please list them below.

_____

_____

7. Do you know of any resources available for funding or materials that would be beneficial for future projects? If so, please list below.

_____

_____

8. Do you have any suggestions of what you would like to see on the schoolyard?

_____

_____

TEACHER SURVEY- sent via e-mail to staff by Principal

TEACHER SURVEY- STAFF

As you know, over the years teachers and staff at R.F. Downey have been working to beautify the schoolyard in order for students to play and learn better. In hopes of making the green schoolyard program more sustainable, two student researchers- Kristin Boyd and Julie Gardner- are working in partnership with R. F. Downey and Emily Straka to develop a Ten Year Green Schoolyard Plan. Involvement and support of all teachers is in this initiative is crucial to its success and sustainability.

In order to assist in the development of the Ten Year Green Schoolyard Plan, a short survey has been developed to receive input from teachers into what they might like to see and help develop in the schoolyard. Please take a few minutes to complete this survey online via surveymonkey.com.

To complete the survey, please go to the following link:

www.surveymonkey.com/s/RPGTRT3

If you have any questions regarding the project, please feel free to contact the researchers. Their contact information is as follows:
Julie Gardner- juliegardner@trentu.ca
Kristin Boyd- kristinboyd@trentu.ca
The researchers may also be reached through the Geography Department at Trent University.

TEACHER SURVEY- online using anonymous survey engine

TEACHER SURVEY- STAFF

By completing the following survey, I understand and agree to the following:

1. My participation is entirely voluntary. I may refuse to answer any and all questions.
2. No personal information is required and surveys are anonymous. All data collected will be used for developing the Ten Year Green Schoolyard Plan for RF Downey Public School and discussed in a report written by the research students.
3. Personal contact information data collected from those who wish to volunteer will be kept in the Department of Geography and kept confidential and will only be accessible by RF Downey Public School's principal.
4. The data from the survey will not be used for any commercial purposes and will be strictly used for the advancement of research.
5. The information will be stored responsibly.
6. Any risk to your participation in the project are unforeseen by the researchers.
7. If you have any questions, you can contact the researchers through RF Downey Public School Staff, which will then be transferred to the researchers as needed.

---

1. Have you ever taken your class outside to learn with the exception of Phys Ed?

2. Would you be willing to take your class outside to learn in an outdoor classroom? Why or why not.

3. What in the curriculum do you think could be taught outside?

4. What are some challenges preventing you from bringing your class outside?

5. What kinds of support could remedy these challenges?

6. What could be added to the schoolyard to encourage learning outside?

TEACHER SURVEY FOR STUDENTS- administered to students by staff member. No personal data collected.

TEACHER SURVEY- STUDENTS

By completing the following surveys with my students, I understand and agree to the following:

1. My participation is entirely voluntary. I may refuse to answer any and all questions.
2. No personal information is required and surveys are anonymous. All data collected will be used for developing the Ten Year Green Schoolyard Plan for RF Downey Public School and discussed in a report written by the research students.
3. Personal contact information data collected from those who wish to volunteer will be kept in the Department of Geography and kept confidential and will only be accessible by RF Downey Public School's principal.
4. The data from the survey will not be used for any commercial purposes and will be strictly used for the advancement of research.
5. The information will be stored responsibly.
6. Any risk to your participation in the project are unforeseen by the researchers.
7. If you have any questions, you can contact the researchers through RF Downey Public School Staff, which will then be transferred to the researchers as needed.

GRADES 1-6

Read aloud to students by teacher: There are two student researchers from Trent University who want to help you make your school yard a better place! These student researchers are looking at your schoolyard and helping Mrs. Straka and the other teachers and they want to get your opinion about where we can plant more gardens, place more trees, and bring more nature into the playground. Do you think you could help these researchers in designing your schoolyard? They want to know ideas you have to make RD Downey's schoolyard a great place to be!

1. Do you like to play outside?
    a. Yes
    b. No

2. What games do you like to play outside?

3. What things do you play with on the schoolyard outside?

4. Has your teacher ever taken you outside to learn?
    a. Yes
    b. No

5. If your teacher has taken you outside to learn, where did you go and what did you learn about?

6. What is your favourite part of the schoolyard?

7. Would you like to have a class outside?
    a. Yes.
    b. No.

8. What would you like to do or learn about if you have class outside with your teacher?

5. What kinds of animals or insects are there in your schoolyard? Name all that you know.

6. Name as many plants and tree types that you can find in your schoolyard.

7. What is your favourite part of the schoolyard?

8. What is your favourite thing to play with on the schoolyard?

9. Check what things you would like to see more of on the schoolyard:
    a. Trees
    b. Gardens
    c. Pond
    d. Seating
    e. Corn maze
    f. Butterfly garden
    g. Artwork
    h. Trails in the forest
    i. Other suggestions:

Appendix C: Proposal

Centre for

Community-Based Research

93 Bobcaygeon Road

Box 655 Minden, Ontario K0M 2K0

Community-Based Education Program

292 London Street, Traill College

c/o Trent University

1600 West Bank Drive

Research Proposal / Project Agreement

Project Title: Greening an Elementary School Yard- Peterborough (#4210)
Course Code and Name: GEOG 4700 Research in Human Geography

Section A: Party to the Agreement

Student
Name: Kristin Boyd — E-Mail: krisitnboyd@trentu.ca
Address: 1755 West Bank Drive, Peterborough, ON K9L 1Z6 — Phone: 705-775-8191

Student
Name: Julie Gardner — E-Mail: juliegardner@trentu.ca
Address: 30 Champlain Crescent, Unit 21, Peterborough, ON K9L 1T1 — Phone: 705-868-0286

Host Organization
Supervisor's Name: Emily Straka — E-Mail: Emily_straka@kprdsb.ca
Address: 1221 Neptune Street Peterborough, ON. K9H 7L9 — Phone: 705-742-7201

Trent University
Instructor's Name: Heather Nicol — E-Mail: heathernicol@trentu.ca
Department: Geography — Phone: 705-748-1011 ex. 7107

Community-Based Education Program
Marjorie McDonald – Peterborough — Email: marjoriemcdonald@trentcentre.ca
292 London St. Peterborough, Ontario K9J 7B8 — Phone: 705-743-0523

Section B: The Proposed Project

1. Purpose of the Project:

The purpose of the project is to document the current state of the school yard by creating an inventory of current vegetation and greening programs already established. By doing this research we will develop a ten year Green School Yard Plan for RF Downey's staff and students. Within this plan we will suggest various projects that the school can work towards accomplishing in the future. This will support RF Downey in their efforts to promote a culture of

sustainability and demonstrate school yard greening practices within the school and surrounding community. By implementing a ten year plan, we will ensure the sustainability of the program despite changes in staff and students.

2. Key Research Question(s):

There are two main objectives within this research project. They include:

a) Developing an inventory of current plants, trees and greening programs already established at RF Downey Public School. This evaluation will allow for a better understanding of the current conditions of the school yard and how students and staff access them. This will be used for later analysis to prepare for the second objective, the Green School Yard Ten Year Plan.
b) Creating a Green School Yard Ten Year Plan with specific outcomes and goals established by the host (Emily Straka) and researchers (Kristin Boyd and Julie Gardner). This plan will identify work to be done, and include maps and suggestions as to what the school can do to continue to improve the future condition of the school yard establish a timeline for their implementation.
c) If time permits, the plan will also incorporate ways to include the school yard into the curriculum, giving teachers and staff specific examples and resources of how to use the space.

3. Key Research Terms:

Geography: There are, and have been numerous definitions of geography over the centuries and the discipline has continuously been redefining itself. The Trent University Geography Department has provided a useful definition of Geography: “Geography is the investigation of our natural world and how people share and interact with the planet. Studying the ways that humans relate with each other and the environment helps us understand how we shape the world and how our world shapes us.”
(http://www.trentu.ca/geography/documents/pointer.pdf)

Green School Yard: A school yard that includes a school garden, a pond or water feature, a native garden, a food-system garden, solar panels, rainwater cisterns, a variety of accessible paths, varied habitats, a gathering place where an entire class can work together outside, seating areas for individuals and small groups, shaded areas, composting bins, creative features such as murals, mosaics, and paving stones and/or other ecologically appropriate teaching tools as one or more of its components. A green school yard can offer children hands-on opportunities to learn about plants and animals, the relationship between seasons and weather, the sun and earth, the interrelationships between living things in the garden, and how to grow food and flowers and care for a garden. (http://sfgreenschools.org) It also offers students a more holistic education and a chance to play a positive role in enriching the vitality of their communities. Children, teachers, parents, and community volunteers all have roles in maintaining the green schoolyard (http://sfgreenschools.org).

Kawartha Lakes District School Board: The Kawartha Pine Ridge District School Board is a school board that serves the Municipality of Clarington, Northumberland County and

Peterborough County. (http://www.kprschools.ca/About%20Us/index.html) Their mission is to educate their students to excel in learning, to succeed in life and to enrich their local communities. (http://www.kprschools.ca/About%20Us/MissionandVision.html).

Ontario Eco Schools: This program is an environmental education and certification program for grades K-12 that helps school communities develop both ecological literacy and environmental practices to become environmentally responsible citizens and reduce the ecological footprint of schools. Their mission is that all students and staff in Ontario school will be engaged in environmental education and environmentally responsible actions in order to develop the knowledge, skills, perspectives and practices needed to be active, environmentally responsible citizens. The program offers resources that provide an environmental perspective to the choices that are made in school operations and teaching the Ontario curriculum. There four main focus areas are ecological literacy, waste minimization, energy conservation, and school ground greening. (http://ontarioecoschools.org/about_us/index.html)

Peterborough: The city of Peterborough is located about two hours Northeast of Toronto on the Trent-Severn Waterway in the heart of the Kawartha region. Peterborough has a population of approximately 76,000 and has a multitude of recreational opportunities, diverse industrial and commercial and agricultural base, quality health facilities and a number of schools, including two post-secondary institutions. Among the Peterborough-based businesses that provide opportunities for many of the local people include PepsiCo Foods (Quaker), General Electric, FisherCast Global, Siemens Milltronics, Minute Maid, and SGS Lakefield Research. (http://www.peterborough.ca/Visiting/About_Peterborough.htm)

Qualitative: A method of research which permits the researcher to study issues in depth and detail, with the researcher being the main instrument of inquiry. This type of research includes personal narratives and observation, in-depth and open ended interviews, direct observation and written documents, with a focus on open response categories. Due to the nature of this type of research, it generally uses a smaller study group. (Patton, M. 1990, Chapter 1, "The Nature of Qualitative Inquiry," in *Qualitative Evaluation and Research Methods,* 2nd Ed., Sage, pp. 9-34)

Quantitative: A method of research that facilitates comparisons and statistical aggregation of data which is compiled into a standardized collection. The test items, survey questions and measurement tools, are seen as instruments of inquiry. This type of research can include questionnaires, structured interviews that include predetermined response categories. Quantitative research, due to the tools employed- such as surveys and questionnaires- usually has a large study group. (Patton, M. 1990, Chapter 1, "The Nature of Qualitative Inquiry," in *Qualitative Evaluation and Research Methods,* 2nd Ed., Sage, pp. 9-34)

RF Downey: A Kindergarten to Grade 6 Public Primary School located in Northwestern Peterborough on 1221 Neptune Street (http://www.kprschools.ca/Schools/R.F.DowneyPublicSchool.html). The school has approximately 215 students (http://rfdowney.kprdsb.ca/about/) and 19 staff

(Final_Project_Proposal_July_2011). The community surrounding the school is both urban and rural, with approximately half of the students traveling to school by bus. (http://rfdowney.kprdsb.ca/conduct/)

Urban Geography: "The geographical study of urban spaces and urban ways of being" (Dictionary of Human Geography, p. 784). Urban geographers are interested in how flows of people, money, information and commodities in cities intersect and are accompanied by economic, political, social, and cultural change (http://www.trentu.ca/calendar/documents/110318undergraduate.pdf).

4. Relevant Geographical Issues and Debates:

Social geography is defined as "the sub-discipline that examines the social contexts, social processes and group relations that shape space, place, nature and landscape" (Ley, 2009). Within this research project, social geography relates to the ways in which the students, staff and community members of RF Downey Public School and the surrounding area have interacted with the natural environment of the school yard in both the past, present and soon to be future. By examining the school yard from a social geographic perspective, we will gain a better understanding of the current use of the environment and how it is shaped socially, using that information to develop the Green School Yard Ten Year Plan.

Also related, environmental history examines how human actions have impacted a natural environment (Wynn, 2009). Recently being 'green' has become a popular topic within geographic research. Some argue that consumers are willing to pay more for 'green products' because of their non-negative impact on the environment (Griskevicius, Tybur & Van den Bergh, 2010). Therefore, within our research examining the environmental aspect and how greening a school yard can impact community choices is important to examine. The environmental history of the RF Downey school yard will be used to aid in the creation of the Green School Yard Ten Year Plan. By doing this evaluation children can gain knowledge and understanding as to where plants and food come from, understanding the distribution of food and the problems within it, linking to environmental restoration and community involvement within environmental projects.

5. Relevant Literature

a) Ozer, E.J. (2007). The Effects of School Gardens on Students and Schools: Conceptualization and considerations for Maximizing Healthy Development. *Health Education & Behavior, 34.6* doi: 10.117/109198106289002

This article describes school gardens in the United States which have gardening programs geared towards involving students to enhance their learning. It identifies previous literature that recognizes the impacts of school gardens on students and providing a guide for future plans. This article is relevant to our work as it will aid in understanding previous school garden projects and their impacts.

b) Ratcliffe, M.M., Merrigan, K.A., Rogers, B.L. & Goldberg, J.P. (2011). The Effects of School Garden Experiences on Middle School-Ages Students' Knowledge, Attitudes, and Behaviors Associated With Vegetable Consumption. *Health Promotion Practice, 12.1.* doi:10.177/1524869909349182

This article examines garden-based education programs in relation to children's vegetable consumption in relation to school gardening practices. The study was performed on students 11 to 13 years of age at two intervention schools and one control school in San Francisco. This article is relevant to our research in that it will aid in understanding previous gardening practices and how programs impact nutrition of students, a major component of a green school yard.

c) Staempfli, M.B. (2009). Reintroducing Adventure Into Children's Outdoor Play Environments. *Environment and Behavior, 41.2*. doi:10.177/0013916508315000

This article examines the idea of play amongst children and the increased concerns in reintroducing children to outdoor play and unstructured play due to decreasing nature of these activities. Adventure playgrounds, also known as junk playgrounds, use the element of recycling and the given environment to inspire outdoor play. This article is useful to our research in better understanding ways in which the given environment and recycled resources can be used for outdoor play, which aids in keeping a low cost to greening a school yard.

d) Lawson, L. (2004) The Planner in the Garden: A Historical View into the Relationship between Planning and Community Gardens. *Journal of Planning History, 3.2*. doi: 10.177/1538513204264752

This article examines community garden programs in the United States since the 1890s, and the both negative and positive impacts they can have. It examines historically how community gardens came to be and how they have changed and developed over time. This article is useful to our research as it will help our understanding of the possible impacts of a community garden on a school and surrounding community in both short and long term.

e) Langhout, R.G., Rappaport, J. & Simmons, D. (2002) Integrating Community Into the Classroom; Community Gardening, Community Involvement and Project-Based Learning. *Urban Education, 37.3*.

This article examines "the tensions faced in facilitating the relationship between teachers and community members while working toward a community garden project" (p.323). The authors use two classroom exemplars as ways of understanding this relationship. This article will aid in better understanding how teachers interact with community members and help us to gain insight when planning our surveys with teachers and the overall plan for the schoolyard itself.

f) Lindholm, G. (1995) Schoolyards; The Significance of Place Properties to Outdoor Activities in Schools. *Environment and Behavior, 27.3*.

This article examines two junior-and-intermediate-level schoolyards, evaluating whether or not the school yards are good or bad depending on what they have to offer students and staff. This will aid in our research in understanding the perceptions of space in relation to people to help prompt us when creating our plan for the RF Downy schoolyard.

g) Chez Panisse Foundation. (2006). Edible School Yard Project. (http://www.chezpanissefoundation.org/)

This website is for the Edible Schoolyard Project, a project that was started by Alice Waters, a pioneering cook, restaurant owner, and food activist in 1996. The foundation supports an educational program that uses food to nurture, educate, and empower youth. (http://www.chezpanissefoundation.org/ who-we-are) At the route of the Foundation's belief is that every child has the right to fresh, healthy food. They believe that public schools are in the best position to provide this. The Foundation has developed three programs to support this vision. These include School Lunch Reform, The Edible Schoolyard, and The Edible Schoolyard Affiliate Network (http://www.chezpanissefoundation.org/ what-we-do). This source will be useful for our research project because we will be able to learn and gain ideas from the online resource center that promotes the sharing of lessons and best practices between educational gardens, kitchen and lunch programs across the US. The website also provides an interactive map that demonstrated the growing impact of the edible education movement. This will be helpful to view in order to get the full scope of the movement that connects children with their food in the US. (http://www.chezpanissefoundation.org/)

h) Evergreen. (2000). School Ground Greening. (http://www.evergreen.ca/en/programs/schools/)

Evergreen is a Canadian non-for-profit charity organization that strives to make cities more livable. Since 1991 they have been engaging Canadians in creating and sustaining dynamic outdoor spaces- in schools, communities, and homes. (http://www.evergreen.ca/en/about/who-we-are.sn) They believe that by deepening the connection between people and nature, and empowering Canadians to take a hands-on approach to their urban environments, the lives and health of Canadians living in cities will be improved (http://www.evergreen.ca/en/about/mission-vision.sn). One of Evergreen's projects is working with schools to assist them to green their schoolyards. This website will be particularly useful for our research project because it provides a wide range of resources including how to plan and design a green school yard, native plant databases, and case studies and examples of schools that have successful green school yard programs. It also has links to a number of other useful websites and publications.

i) Meyer, K. (2011). Green Schoolyard Network. (http://greenschoolyardnetwork.org/)

The Green School Yard Network is an organization dedicated to transforming schoolyards into dynamic centers for teaching and learning, health and fitness, environmental literacy and community life (http://greenschoolyardnetwork.org/). It arose out of the need for there to be a place for networking between the different schools that were involved in greening schoolyard initiatives across the US in order to share best practices and learn from one another. The mission of the organization is to create a Community of Practice for schoolyard activists so that they can share their successes and failures, collaborate on issues of mutual concern, and speak with a collective voice to advance and improve the movement of green school yards (http://greenschoolyardnetwork.org/abouthttp://greenschool yardnetwork.org/about-gsn/-gsn/). The Green School Yard Network is set up as a blog until they receive enough funding to create a full website. The blog provides an extensive list of free publications concerning sustainability education, connecting students with nature, and food programs in schools. The blog also has a gallery depicting greening schoolyard initiatives at schools across the US, which provides a nice visual of what kinds of activities, projects, and diversity of people are involved in these projects.

j) Sustainable School Yards. (2011). (http://www.sustainableschoolyard.org/)

Friends of Smart Growth and Sustainable Communities is a diverse group of US national organizations including American Farmland Trust, American Planning Association, The Cloud institute for Sustainability Education, CONCERN, Inc., The Conservation Fund, National Association of Counties, National Association of Realtors, and Smart Growth Network, that have come together to create the Sustainable Schoolyards exhibit and website (http://www.sustainableschoolyard.org/about-us). Sustainable Schoolyard's goal is to create smart, healthier and more livable communities. The purpose of the exhibit is to illustrate some of the outdoor classroom concepts, ecological teaching tools, and creative play ideas that can be added to almost any schoolyard. The features included in the design of the exhibit are based and replicate designs of already existing green school yards across the US, and are therefore very practical and realistic (http://www.sustainableschoolyard.org/) This website will be helpful in explaining the importance of sustainable schoolyards because it has a number of downloadable documents that illustrate why sustainable schoolyards help to create active, livable, and green communities. It also has a number of school yard designs that will be useful in giving us ideas of how R.F. Downey's school yard can be organized over the next ten years.

k) San Francisco Green Schoolyard Alliance (n.d.) (http://sfgreenschools.org/)

The San Francisco Green Schoolyard Alliance serves children and families of San Francisco by promoting and supporting green schoolyards. They provide resources, training, and advocacy to school communities in order to help them create and sustain outdoor learning environments (http://sfgreenschools.org/). The Alliance envisions a future in which each schoolyard operates in unity with its neighborhood and local ecology to foster higher academic achievement, increased environmental stewardship, creativity, and community building. In order to achieve

this mission, the Alliance partners with community members, educators, students, public officials, and other supporters; actively encourages the integration of green schoolyards with student learning; makes the case for green schoolyards based on research and best practices; advocates for favourable public policy for green schoolyards; secures financial and volunteer resources; and advocates and encourages efficacy and sustainability in the creation and stewardship or each green schoolyard. (http://sfgreenschools.org/about-2/) Although the organization focus area is San Francisco, their website is still a valuable resource as they provide full-lists of links to a number of other school garden related organization, local environmental education organizations and publications, curriculum resources, and how to get started, many of which are as relevant and useful to schools in Canada.

6. Study Area:

The City of Peterborough is located on the Trent-Severn Waterway one hour away from Toronto (see attached Map 1). The population of Peterborough is approximately 135,000 (City of Peterborough, 2009) which increases during the summer months. RF Downey Public School is located in the North end of Peterborough on Neptune Street. The school is a part of the Kawartha Pine Ridge District School Board (KPRDSB) and is an elementary school for grades K-6. The school has approximately 216 students in ten classrooms. The students that attend the school come from a designated area provided by the KPRDSB (See Map 2, attached). According to Map 3 (see attached) designed by Elliot and Parr OLS, the school grounds cover 8.55 acres of land. The area which will be used for this research project is highlighted on the map as the shade of green. Picture 1 (see attached) provides an aerial view of the RF Downey schoolyard and property. The focus of the research will be on the schoolyard outside of the main building and the vegetation that is currently present.

7. Methodological Approach:

Major steps:

We have provided an estimated timeline (see #10 below) of the number of hours we predict to dedicate on various elements within our research project. This will involve developing and researching our project, allowing for flexibility for extra work when needed.

Approaches:

Quantitative research (inventory)- we will be taking inventory (pictures and data) of the current vegetation, including types of plants and trees, within the schoolyard. As well, we will be examining current play structures, buildings or equipment present on the schoolyard. This quantitative data will be used to examine the current school yard conditions to plan for the future. The data will also be used to provide an undated map of the school yard from the previous survey done in 1999. This inventory will aid in understanding what additions can be made to the school yard in the Green School Yard Ten Year Plan. (See Table 1, attached for inventory sheet).

Literature Review: we will examine and consult a variety of resources (see #5 above) of previously investigated green school yard and community garden practices. Reviewing these websites and articles will aid in the development of the Green School Yard Ten Year Plan for RF Downey.

Qualitative research (survey)- we will be surveying teachers/staff and Parent Council of RF Downey Public School to determine their opinions on: a)the current conditions of the schoolyard; b)where they would like to see the schoolyard changed and improved; c)how they would like to use the schoolyard for learning; and d)any suggestions for the Green School Yard Ten Year Plan. We will also use our host, Emily Straka as a liaison to survey students in asking them what they would like to see in the schoolyard to play on and how they would like to learn in the schoolyard. We will require an ethics application to do so.

Case study comparison- using Peterborough's Ecology Park as an example of a successful community plant garden, we will use the ideas and techniques implemented to aid in developing the Green School Yard Ten Year Plan.

Methods:

- Inventory of quantitative data from collecting what is present on schoolyard (pictures and use of chart)
- Literature comparison and analysis for the use of developing suggestions for the Green School Yard Ten Year Plan
- Focus groups with teachers/staff and Parent Council through the transcription of interviews and surveys provided (quantitative and qualitative answers in surveys)
- Survey analysis (quantitative and qualitative) with student responses
- Map development software to create an updated map of the current RF Downey School Yard
- Create a Green School Yard Ten Year Plan outlining suggestions and recommendations for the future schoolyard at RF Downey

Methods Analysis:

- Creating graphs, charts and maps from the inventory of plants, trees and vegetation
- Critiquing the literature available to provide evidence of green schoolyard practices that have been successful to aid in the development of the Green School Yard Ten Year Plan (using the literature for suggestions)
- Transcribing notes during focus groups with teachers/staff and Parent Council and providing responses to aid in developing what they want to see in the Green School Yard Ten Year Plan
- Transcribing and analysing responses of student surveys to aid in understanding how they wish to learn to develop the Green School Yard Ten Year Plan

8. Ethics Application:

The project does involve human research (i.e., "any person who is a source of raw unformulated data and who is not acting as, or assisting, the principal investigator", SSHRC).

The researcher has applied or will apply to the Department of Geography to undertake human research and adhere to all policies and ethical guidelines established by the University.

9. Duration of Placement:

The placement will begin on October 5, 2011 and end on April 19, 2011.

10. Project Timeline:

Task, Activity, Meeting	**When**	**Who**	**Total Hours**
Initial Meeting	Oct. 5, 2011	Emily Straka, Kristin Boyd, Julie Gardner, Marjorie McDonald	1 hour
Project Proposal Work	Oct. 26, 2011	Kristin Boyd & Julie Gardner	10 hours
Meeting with Host & initial surveying grounds	Oct. 26, 2011	Emily Straka, Kristin Boyd, Julie Gardner	2 hours
Project Proposal Work	Oct. 26-Nov.3	Kristin Boyd & Julie Gardner	20 hours
Ethics Application Work	Nov. 3-7 2011	Kristin Boyd & Julie Gardner	25 hours
Ethics Application Due	Nov. 7, 2011	Kristin Boyd & Julie Gardner	1 hour
Presentation Proposal Power Point	Nov. 9	Kristin Boyd & Julie Gardner	1.5hours each (have PP ready by Nov. 9)
Presentation Proposal	Nov. 10, 2011	Emily Straka, Kristin Boyd, Julie Gardner, Marjorie McDonald, Heather Nicol	1 hour
Work on Literature Review & Methods	Nov. 10-Dec. 7	Kristin Boyd & Julie Gardner	50hours (meet on Dec. 7)
Literature Review & Methods	Dec. 8, 2011	Kristin Boyd & Julie Gardner	1 hour

Meeting with Host	January 2012	Kristin Boyd, Julie Gardner & Emily Straka	1 hour
Survey staff & students	January 2012	Kristin Boyd, Julie Gardner & Emily Straka	20 hours
Analyze Data	January 2012	Kristin Boyd & Julie Gardner	50 hours
Write First Draft	Jan./Feb. 2012	Kristin Boyd & Julie Gardner	100 hours
Review First Draft & Put together	February 15, 2012	Kristin Boyd & Julie Gardner	1 hour
First Draft of Project	Feb. 16, 2012	Kristin Boyd & Julie Gardner	1 hour
Develop Poster Presentation	March 2011	Kristin Boyd & Julie Gardner	14 hours
Finding Seminar (Power point to host/faculty)	March 29, 2012	Kristin Boyd & Julie Gardner	1 hour present 12 hours prep
Poster Presentation	Ap. 5, 2012	Kristin Boyd & Julie Gardner	10hours
Prepare Final Report	Jan.-Apr. 2011	Kristin Boyd & Julie Gardner	200 hours
Final Report Due	Ap. 5, 2012	Kristin Boyd & Julie Gardner	1 hour
Revisions of Final Report Due	April 19, 2012	Kristin Boyd & Julie Gardner	20 hours

11. Total hours required to complete this project:

The total number of hours required to complete this project is estimated at 440 hours. Not all meeting times and research are included in the above table as more hours will be put in as necessary when times arise; this allows for greater flexibility within the research project and time to be dedicated as needed.

12. Project budget and resources required:

Expense	Reason	Coverage
Photocopies of surveys for teachers	Teacher will receive a survey to evaluate how they view and access the current school ground versus	All costs covered by host organization when performed at RF Downey Public School

	how they hope to access it in the future	
Poster Supplies	For the poster presentation required for the project	Trent Community Based Research Center
Digital Voice Recorder	Required for teacher interviews and parent interviews	Trent University Geography Department- free
Computers for surveys	Surveys will be given to students via Emily Straka on the computer	RF Downey Public School will provide computers to students in the library
Maps of RF Downey & School Yard	Maps will be used to analyze and compare the school yard to create the Green School Yard Ten Year Plan	Emily Straka (free)

13. Project Deliverables and Dissemination of Findings:

Project Report I: Research Proposal:
The Research Proposal outlines what our project is, the key research questions and how we plan to answer them as student researchers. Meeting with our Host, Emily Straka we have come up with the information required to complete our research. Due November 2011.

Presentation I: Proposal:
The presentation will be done on a power point and will outline what we have included in our project proposal. Given to both the TCCBE staff, Professor, Host and peers, our project proposal will be evaluated for what is missing and will need to be completed during the research process. Due on November 10, 2011.

Project Report II: Literature Review & Methods:
We will conduct a literature review to examine what current research is being done in regards to greening school yards. After reviewing the data available and summarizing our findings, we will present out methods as to how we wish to use the researched data in our project in the methods section. Due on December 8, 2011.

Presentation II: Community Event Poster:
The poster will be prepared based on our research findings and it will be presented to the host organization, community members, professors, peers and community education staff. The poster will display our research outcomes in a unique and formal way to be used to advertise our findings. Due March 24, 2012.

Presentation III: Findings Seminar:
We will prepare a formal presentation of our research to present to the host, community partners, professors, peers and community education staff. This will occur on March 29, 2012.

Project Report IV: Final Report:
The final reports will be handed in electronically for editing by the course instructor, Heather Nicol. Due April 5, 2012.

TCCBE Knowledge in Action Peterborough
A presentation to community members to demonstrate the findings of our project on April 5, 2012.

Project Report Revisions:
Revisions of the report will be made and the report will be printed and re-submitted to the course instructor and host organization no later than April 19, 2012.

Section C: Responsibilities

Responsibilities of All Parties:
1. Each party to this agreement has the right to initiate renegotiation of this agreement if circumstances affecting the project change.
2. Each party has the right to terminate the placement if the conditions of the agreement are not being met. Because of the potential consequences to a student's program of study, a decision to terminate the placement must be made in consultation with TCCBE/U-Links.
3. The student owns the copyright for all work completed as part of his/her project, but the host organization may use all project reports or papers, in whole or in part, as it sees fit as long as the student is duly credited as the author. (If work is completed collaboratively between the student and staff of the host organization, copyright will be jointly held.) A copy of any report or paper completed as part of the project will be added to the TCCBE Resource Centre, the Haliburton County Collection housed at U-Links, as well to the local public library system to be available to the community.
4. All parties must complete the pertinent section of the form entitled Work/Education Placement Agreement/Post Secondary, to enable the Ministry of Education to purchase workers compensation or private insurance coverage for the student.

Responsibilities of the Student:
1. Undertake the project conscientiously and with due respect to the expectations of the host organization and the University.
2. Keep his/her instructor and TCCBE/U-Links informed of the project's progress and notify them of any concerns about the placement or the host organization in a timely fashion.
3. Attend and participate in all necessary meetings (with his/her instructor, placement supervisor and/or TCCBE/U-Links.)

4. Ensure that the confidentiality of any information acquired in the course of his/her placement is strictly maintained, notwithstanding the host organization's commitment to make the results of the project publicly available.
5. Provide a copy(s) of the final product(s) of the project to the host organization and TCCBE/U-Links.
6. Upon the advice of his/her instructor, comply with ethical guidelines and review procedures.

Responsibilities of the Host Organization:

1. Orient the student to the organization and work site. Ensure the student understands any risks or hazards that may exist and the safety practices followed. Promptly report any incidents to TCCBE/U-Links.
2. Provide adequate direction, ongoing communication and feedback on the quality of work so as to enable the student to complete the project successfully.
3. Supply/provide resources listed above needed to complete the project.
4. Be available for occasional consultation and meetings with TCCBE/U-Links as needed for the purpose of monitoring the placement or refining the Community-Based Education Program. Cooperate in evaluation activities initiated by the instructor or TCCBE/U-Links.
5. Comply with policies and ethical guidelines governing research projects conducted in conjunction with Trent University and TCCBE/U-Links, as advised by TCCBE/U-Links, the instructor or the student.
6. Cover all project related costs such as lab fees, extensive photocopying, office supplies, long distance telephone charges, audio/video tapes and some transportation costs.

Responsibilities of the Instructor:

1. Ensure that the project, as described above, fulfills the requirements of the course listed on page one.
2. Provide guidance of an academic nature, advise on and monitor research methodologies employed. Evaluate the student's learning and grade his/her work.
3. Meet with the student at regular intervals, at least monthly, throughout the term.
4. Inform TCCBE/U-Links promptly of any missed meetings, breakdowns in communication, incomplete research/assignments or other incidents that may affect the success of the project.
5. Determine the need for the research project to be reviewed by the department's ethics committee. Alternatively, the TCCBE/U-Links Joint Ethics Committee may review the project if more appropriate. (Protocol and Application for Ethical Review are available upon request.)

Responsibilities of TCCBE/U-Links:

1. TCCBE/U-Links will endeavor to ensure the instructor, the student and the host organization understand and approve of the nature of the work to be undertaken on the placement.
2. TCCBE/U-Links will serve a liaison function among these parties, will offer advice on best practices in Community-Based Education and assist in overcoming any difficulties throughout the project.

3. Where appropriate, TCCBE/U-Links may form and facilitate peer support and project coordination meetings for students working on projects, to enhance learning and coordinate projects.

Section D: Signatures

By signing below, you are stating that you agree to the above terms regarding this Community-Based Education Project. You have a full understanding of what the project entails and what your responsibilities are for the duration of the project. If any aspect of this agreement is altered, all parties must be notified, the agreement amended and re-signed by all parties involved.

Student(a): _____
Date Print Name Signature

Student(b): _____
Date Print Name Signature

Instructor: _____
Date Print Name Signature

Host Organization: _____
Date Print Name Signature

CBE Staff: _____
Date Print Name Signature

Map 1- City of Peterborough location
Map 2- R.F. Downey Public School Boundaries
Map 3- RF Downey Schoolyard Plan, 1995
Picture 1 RF Downey Schoolyard aerial view

Table 1- Inventroy of plants on schoolyard

Picture #	Type of plant/object	Location	Description

Appendix D: Poster

GREENING THE SCHOOLYARD

Creating a Ten Year Green Schoolyard Plan for R.F. Downey Public School

Students: Kristin Boyd & Julie Gardner| Supervising Professor: Heather Nicol |GEOG 4700| Host Supervisor: Emily Straka|March 2012

Purpose

The purpose of this project is to develop a Ten Year Green Schoolyard Plan in collaboration with staff, parents and students at R.F. Downey Public School. The Plan will outline goals for the development of green schoolyard infrastructure and programming over the next ten years. The Plan is important as it will help to promote a culture of sustainability within the school and ensure the longevity of greening programs and practices despite changes in staff and students.

Host Institution

R.F. Downey Public School is part of the Kawartha Pine Ridge District School Board and has approximately 200 students enrolled in Grades K-6 . The school's property is 8.55 acres.

Methodology

The main steps that were taken towards creating the Ten Year Green Schoolyard Plan included:

1. The development of an inventory of plants, trees and other greening programs already established at the school. This allowed for a better understanding of the current condition of the schoolyard and how it could be improved.
2. A thorough examination of literature about previously or currently established green schoolyard programs including their benefits, structure/dynamics, challenges and advice for improvements. This was helpful when brainstorming ideas of what should be included in the Ten Year Green Schoolyard Plan.
3. The distribution of surveys to staff, students, parents and community members in order to gather information on how they use the schoolyard and how they would like to use it in the future.

Preliminary Findings

- In the JK/SK classes the majority of children answered 'no' when asked whether their teachers brought them outside to play, while the majority of students in the 1-6 classes answered 'yes.'
- The staff survey revealed that teachers take their students outside but face challenges such as bad student behaviour and the need to plan ahead
- Parents expressed concerns about safety, the need for more play equipment and incorporating more trees and flowers into the schoolyard

Next Steps

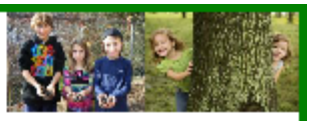
1. Conduct focus group interviews with staff
2. Create the Ten Year Green Schoolyard Plan which will include maps and diagrams of the recommendations

The Trent Centre for Community-Based Education

TRENT UNIVERSITY

Appendix E: Additional Resource

GREENING THE SCHOOLYARD



What is a green schoolyard program?

Research shows that children need to experience the earth's natural and outdoor environments. Despite this, there are a number of factors that are keeping children disconnected from these environments. A green schoolyard provides children with a more holistic education by offering them hands-on opportunities to learn about plants and animals, the relationship between seasons and weather, the sun and earth, the interrelationships between living things in the garden, and how to grow food and flowers and care for a garden. It also provides the space and infrastructure that allows and encourages imaginative play and development of gross-motor skills.

1. **A space for learning in all subjects**
2. **A space for play**

Why establish a green schoolyard program?

There are numerous benefits of green schoolyards. **Social.** Increased freedom of choice provided by green schoolyards has proven to decrease aggressive behaviour and lower crime rates. Due to the fact that green schoolyard plans encourage imaginative play, students' creativity and decision-making abilities increase. Green schoolyards are also known to be beneficial to students with special needs, such as autism, as they support their individual desires to interact with the environment the way they want to. When designing green schoolyards, it is important to make the design appropriate both for girls and boys as studies have shown that they play differently. **Academic.** Green schoolyard programs also increase students' enthusiasm for learning which helps them excel academically. Students with learning styles that do not normally lend well to excelling in the classroom can often flourish on the schoolyard. This can greatly increase their confidence and change the social dynamic of the class. **Health.** Garden programs on green schoolyards give students the opportunity to experience and actively participate in the entire process of food production from planting, growing, picking and eating. This helps them appreciate the value of fruits and vegetables and create life-long eating habits that can help them stay clear from chronic diseases such as diabetes, obesity and cardiovascular disease. **Environmental.** Green schoolyards also help to raise environmentally conscious individuals who understand the value of the natural environment and will be willing to take steps to protect it throughout their lives.

Where have green schoolyards programs been established?

Everywhere! Schoolyard greening initiatives have taken place at schools throughout the United States, Britain, Canada and other countries as well. There are a number of organizations and businesses throughout North America designed to assist schools in greening their schoolyards.

Who is involved in establishing green schoolyard programs?

Actors involved in green schoolyard programs include students, teachers, parents, community members, organization, businesses, and the government. The more stakeholders involved, the better the success and guarantee of longevity of the green schoolyard program.

How do you establish a green schoolyard program?

There is no one way of greening a schoolyard; the establishment of green schoolyard programs within schools is a very organic process. Green schoolyard programs can include a variety of elements; usually starting with an initial plan, these elements develop gradually as the needs of the students and staff change. Green schoolyards **have included** the following: vegetable and flower gardens, community gardens, habitat gardens, butterfly gardens, ethno botanical gardens, greenhouses, worm composting, tree nurseries, bird and bat houses, native shrub collections, woodlands, meadows, ponds, ecological drainage systems, outdoor classrooms, sun shelters, seating, large rocks, shade trees, pathways, public art installations, community map mural games, sundials, time capsules, and archways.

Although there is no standard approach that a school can take when establishing a green schoolyard, below are suggested **STEPS** that can be followed:

1. Gather interested and dedicated individuals willing to be involved.
2. Conduct an analysis of the current state of the schoolyard which includes an inventory of the vegetation and other existing infrastructure.
3. Identify the needs of the school as well as how the schoolyard can be improved and where greening programs can be established.
4. Establish a plan that includes a timeline of when these improvements will be made.
5. Step into action! Start implementing the changes step-by-step.
6. Voila, your green schoolyard program is in existence!

Appendix F: The Ten Year Green Schoolyard Plan

R.F. Downey Public School's

Ten Year Green Schoolyard Plan 2012-2022

SUBMITTED BY KRISTIN BOYD & JULIE GARDNER

April 20, 2012

IN COLLABORATION WITH

Trent University Geography Department

&

The Trent-Center for Community Based Education

A Note to the Reader

Welcome to R.F. Downey Public School's Ten Year Green Schoolyard Plan. In collaboration with Trent University and the Trent-Center for Community Based Education, this Plan has been created for the betterment of all staff, students, parents and community members involved with R.F. Downey Public School's schoolyard. Within this report you will find a basic outline of goals for the schoolyard of R.F. Downey Public School for the next ten years.

It is our hope as researchers that despite changes in staff and students, this Plan will be implemented and used in the years to come.

Within this report you will find the following:

- A description of the condition of the schoolyard as of 2012
- The Ten Year Green Schoolyard Plan - Overview and Summary

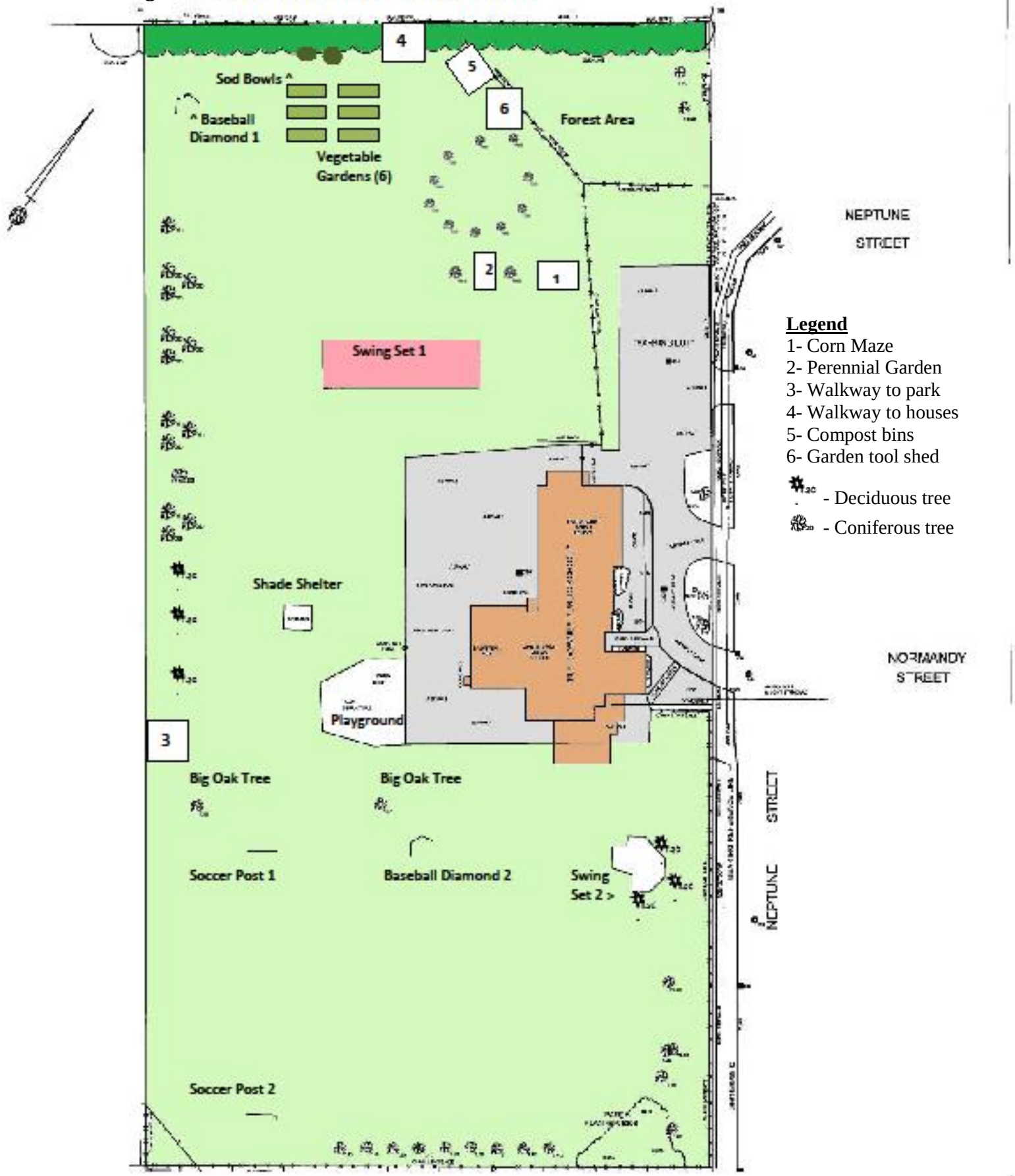
Current Condition of R.F. Downey Public Schoolyard - 2012

Over the years, staff and parents at R.F. Downey Public School have been working hard to make their schoolyard 'greener' and a better place to play and learn. The following map (Figure 1) and table (Table 1) demonstrate the natural aspects and infrastructure of the schoolyard that are present as of April 2012.

Table 1: The location of natural items/greening aspects on R.F. Downey Public School's schoolyard in April 2012

Natural Item/Greening Aspect	Location on Schoolyard
Community garden plots (6)	North- near walkway to subdivision
Compost Boxes (3)	North- near walkway to subdivision
Gardening tool shed	North- near walkway to subdivision
Perennial Garden	East- near schoolyard entrance from parking lot
Corn Maze	East- near schoolyard entrance from parking lot
Circle of tree's (10)	East- near schoolyard entrance from parking lot
Row of Trees (14 coniferous & 3 deciduous)	West along fence shared with park
Big Oak trees (2)	Central near walkway to park
Shade shelter	Central north of playground
Sod bowls	North near fence
Forested Area	Northeastern corner of the schoolyard

Figure 1: R.F. Downey Public Schoolyard 2012



A Vision of R.F. Downey Public Schoolyard in Ten Years - 2022

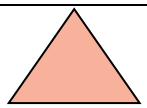
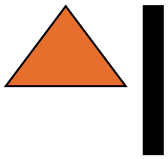
With input from students, staff, parents and community members we created a vision of what R.F. Downey Public School will look like in ten years. The following map (Figure 2) and corresponding table (Table 2) represent the features that have been suggested for addition over the next ten years.

Table 2: Suggested additions to R.F. Downey's Schoolyard over ten years

Project & Map Reference	**Year of Implementation**	**Location on Schoolyard/what it entails**
A. Build a second shade shelter B. Build a sandpit with a cover	Year 1 (2012-2013)	A. Near the Kindergarten area B. Located under or near the shade shelter
Create an outdoor classroom	Year 2 (2013-2014)	1. Seating located within semi-circle of trees on East side 2. Create a semi-circle located near the big oak tree
Improve the conditions of the school gardens	Year 3 (2014-2015)	-Re-evaluate whether or not to move the vegetable gardens closer to a water sources -Create more vegetable gardens -Install butterfly garden -Install borders around flower beds to prevent weeds -Install rain barrels for water collection
Build natural landscape for play	Year 4 (2015-2016)	-create man-made hills -create man-made "nest" -Install fake wasp nests to solve wasp problem
Adventure playground phase one	Year 5 (2016-2017)	Various levels to step on (ex. stumps, rocks)
Adventure playground phase two	Year 6 (2017-2018)	Hill slide, tire swing, obstacle course, game tables
Plant more trees	Year 7 (2018-2019)	North end, near fence
Create trails and habitat area	Year 8 (2019-2020)	Kindergarten area
Build schoolyard trail	Year 9 (2020-2021)	Around school grounds
Create community garden plots	Year 10 (2021-2022)	West end near Kindergarten area

Figure 2: R.F. Downey Public Schoolyard 2022

Legend:

Item	Year of Implementation	Shape on map
A. Build a second shade shelter B. Build a sandpit with a cover	Year 1 (2012-2013)	A:  B: 
Create an outdoor classroom	Year 2 (2013-2014)	
Improving the conditions of the school gardens	Year 3 (2014-2015)	
Build natural landscape for play	Year 4 (2015-2016)	
Adventure playground phase one	Year 5 (2016-2017)	
Adventure playground phase two	Year 6 (2017-2018)	
Plant more trees	Year 7 (2018-2019)	
Create trails and habitat area	Year 8 (2019-2020)	
Build schoolyard trail	Year 9 (2020-2021)	
Create community garden plots	Year 10 (2021-2022)