

OUTSTANDING ENVIRONMENTAL EDUCATION PROGRAMS IN NORTH AMERICA

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I. Introduction: the importance of environmental education

The growing importance of environmental education today is evident in the increase and wide range of programs available from the pre-school to the university level, in a wide variety of forms (Palmer, 1998). This expansion is set against a backdrop of increasingly complex and intertwined environmental, social, and economic issues that societies currently face. Proponents of environmental education (in the broadest sense of the word) see learning by exposure to the 'natural' world as a vehicle to facilitate an integrated understanding of the complexities, but also the beauty of, interactions between humans and other species within the biosphere (United States Environmental Protection Agency, 2010). In this way, environmental education is coming to be seen as an investment in healthy, critically-thinking generations of children with a strong connection to their environment, an investment that is crucial to the future of the planet (United States Environmental Protection Agency, 2010).

A. The Research Question: objectives and boundaries of study

There are several objectives of this report:

- To investigate a problem of a perceived lack of information about environmental education programs available to elementary school aged children in North America.
- To come as close as possible to finding programs within North America which emulate the originally Scandinavian idea of forest school. If there are few examples, to expand to find programs where environmental and outdoor education is fully integrated into the education system, and where the approach to learning is in some way outstanding.
- To provide a guide for educators and parents interested in the topics of education and the environment, with information on both the basic logistical components of programs and an analysis of what makes the program outstanding.

The scope of the study includes those programs where outdoor and environmental education are fully integrated into the daily activities of the children, and run by the school itself. The study excludes all programs and schools where environmental or outdoor education are 'outsourced' to other organizations (like outdoor education centres or non-profit groups) or the environmental component is only short-term (for example, one week out of every year) and does not link directly and consistently into the classroom curriculum.

B. Background to Environmental Education: conceptual definitions

The field of environmental education is vast and varied, with many different location-specific terms which have grown out of different past environmental movements (Palmer, 1998). This section will attempt to define some of the more commonly used terms in educational and environmental circles, and identify those which are most applicable to this research. Although the terms discussed form an overlapping spectrum rather than distinct and separate concepts, some terms are more relevant to the research here than others.

- i. Experiential education** is an umbrella term that includes outdoor and environmental education, among others. It is “a philosophy and methodology in which educators purposefully engage with learners in ... the process of making meaning from direct experience ... in order to increase knowledge, develop skills and clarify values” (Rowley, 2010, p. 5). Because this type of learning can occur in many different settings, it forms the basis of the approach for the programs included in this report.
- ii. Environmental education** is an approach to education where through practical experience and first hand encounters in natural environments, learners build understanding, critical thinking and problem-solving skills (commonly called an environmental ethic, or eco-literacy) based on the fundamental concept of the interconnectedness of humans and environmental systems (Rowley, 2010). The goal, as set out in the Belgrade Charter (one of two founding documents by the United Nations Educational, Scientific and Cultural Organization that form the basis of understanding in this field) is to “develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones” (United States Environmental Protection Agency, 2010, p. 1). Environmental education forms a solid foundation for all programs included in this report.
- iii. Outdoor education** is “education for, in, and about the outdoors, where students are exposed to the outdoors in typically intense sessions such as high ropes courses or rock-climbing” (Rowley, 2010, p. 6). These activities are often not integrated into the regular curriculum, but instead are usually short term (a few hours, days, or one week) and are run through an organization outside of the school (Palmer, 1998). Based on this interpretation,

outdoor education forms a crucial component of some of the programs included in this report, but in order to fit the other requirements of the research (that environmental education is incorporated fully into the curriculum), the program must demonstrate more than just a basis in outdoor education.

- iv. **Forest school** (or forest kindergarten/nature kindergarten) is an “outdoor education experience in which students visit the same local woodland on a regular basis over an extended period of time” (Mason, 2012). The learning approach is based on the interests of the individual child, with the goal of creating an integrated understanding and respect for world systems as a whole. The approach, which originated in Northern Europe (particularly Sweden) in the 1950’s, has been shown to improve “fine motor skills, concentration, motivation, self-esteem, self-confidence, and independence, ability to work with others [and] language development” (Mason, 2012). The purpose of this research is to come as close as possible to finding programs at the elementary-school level that emulate this educational approach.
- v. **Waldorf education** was developed from the principles of the Austrian Rudolf Steiner, and is an approach (like forest school) that focuses on tailoring learning to the specific needs of each child. The approach focuses on experiential education involving the “head, heart, and hands” and curriculum-based environmental and outdoor education forms a large part of this approach (The South Shore Waldorf School and Kindergarten, 2012; Calgary Waldorf School, 2010; personal communication, March 28, 2012). Those Waldorf programs that demonstrate inclusion of environmental and outdoor education in a particularly notable way have been included in this report.
- vi. **Eco-school initiatives** in Canada and the US are part of the larger international Eco-schools program, started by the Foundation for Environmental Education and European Commission. The program’s foundations are in environmental education, but the wide array of initiatives in schools worldwide resulting from the efforts of this program (from recycling programs to outdoor forest classrooms) means that it is afforded a separate category of explanation. The program is meant to provide “a framework to help educators integrate sustainable principles throughout their schools and curriculum”, and aims to promote eco-literacy in schools by a certification process that rewards schools efforts of ‘greening’

(National Wildlife Federation, 2012). Those programs that have taken this aim and managed to integrate environmental education fully into the curriculum through this process have been included in this report.

II. Literature Consulted

For information on the introduction and background, I used academic sources (such as PhD theses and books on education theory) and publications from governments and international organizations (like The United Nations Environment Programme). I developed the methods and evaluation criteria using the North American Association for Environmental Education *Guidelines for Learning (K-12)* report which provided a solid framework for identifying and analyzing specific school programs. For the results and specific school programs identified, I used a variety of grey literature and non-academic sources, such as news pieces where schools received environmental awards, publications by environmental non-profit organizations such as the National Wildlife Federation, online educational databases, school board websites in the US and Canada, and websites about specific government initiatives. Once I identified a potential program, I gained as much information as I could from their website, and then contacted individuals in the program via email for more details.

III. Methods and Evaluation Criteria

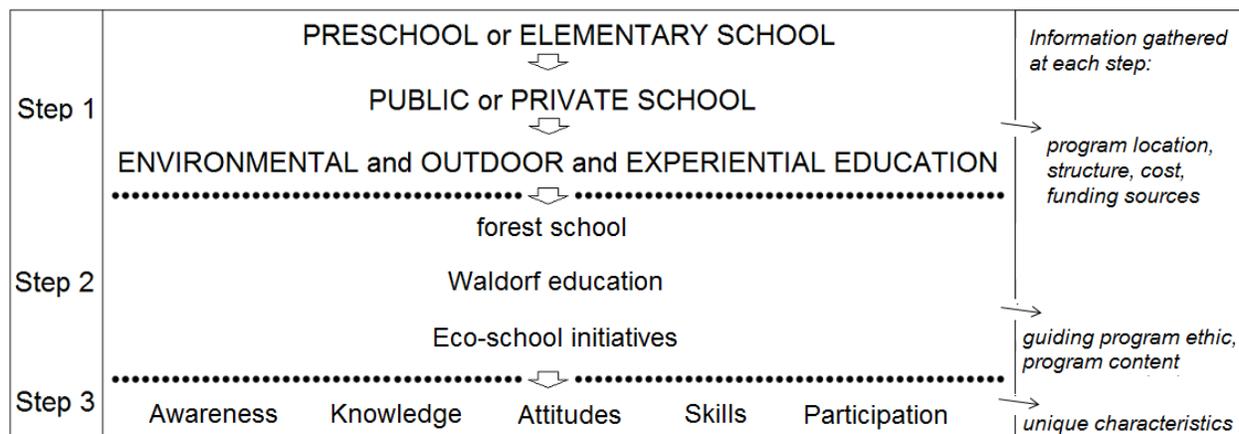


Figure 1. Flowchart of the evaluation process.

In step one, the program had to include all the elements listed, where environmental, outdoor and experiential education were all part of the regular curriculum, and students consistently spent time learning in the outdoors, about the outdoors. In step two, my background research allowed me to conclude that beyond forest school, Waldorf, and then Eco-school initiatives, were the programs

most likely to fit all the research parameters. In step three, after I decided on specific programs which fit all previous requirements and had a high possibility of being included in the final report, I evaluated each one based on guidelines provided by the North American Association for Environmental Education's *Excellence in Environmental Education: Guidelines for Learning (K-12)*. This publication lists five concepts fundamental for the success of environmental education programs. To be considered 'outstanding' and included in the final report, all programs researched had to demonstrate these standards to a high degree.

- **Awareness** : students should acquire a “sensitivity to the total environment”
- **Knowledge**: students should “gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems”
- **Attitudes**: students should “acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection”
- **Skills**: students should “acquire the skills for identifying and solving environmental problems”
- **Participation**: student’s should “be actively involved at all levels in working toward resolution of environmental problems” (United States Environmental Protection Agency, 2010, p. 90)

IV. Results: a comparison of outstanding programs

Table 1: Summary table of results. Programs where environmental and outdoor learning are fully integrated into the curriculum, and a substantial amount of time is spend outdoors each day. Results within each heading are listed in order of relevance, starting with the program that demonstrated the requirements best. Descriptions and analysis of each program are provided below in same order as table.

Area	Guiding Program Ethic	Program Name and Location	Cost
Canada	i. Forest School	Maplewood Forest School, Ontario (preschool to early elementary)	Through private schools
		Carp Ridge Forest Preschool & Forest Kindergarten, Ontario (preschool aged, expanding to older ages soon)	Private school - \$50/day (including organic lunch and snacks)
		Sangster Elementary School Nature Kindergarten, BC (kindergarten, starting September 2012)	Public school*
	ii. Waldorf education	Sunrise Waldorf School, BC (preschool to upper elementary)	Private school - from \$5060 (kindergarten) to \$6670 (grade 8)/school year

	iii. Eco-school initiatives	Toronto Island Public/Natural Science School, Ontario (preschool to upper elementary)	Public school*
		Environmental School Project, BC (kindergarten, elementary)	Public school*
		Holyrood School, BC (kindergarten to upper elementary)	Public school*
United States	i. Forest School	Cedar Song Nature School, Washington (preschool, kindergarten)	Private school - \$120 - \$360 (depending on number of days/week)
		Madison School Forest, Wisconsin (kindergarten to upper elementary)	Public school*
	ii. Eco-school initiatives	Oakwood Environmental Education Charter School, Wisconsin (kindergarten to upper elementary)	Public school*
		Emily Dickinson Elementary and Explorer Community School, Washington (kindergarten to upper elementary)	Public school*
		Savannah Country Day School Lower School, Georgia (preschool to upper elementary)	Private school - \$13 560/year (elementary school age)
		Hacienda Environmental Science Magnet, California (kindergarten to upper elementary)	Public school*

*Publicly funded, cost unknown (as borne by local taxpayers)

A. Canada

i. Forest Schools

Since its Scandinavian beginnings, forest schools have spread to the United Kingdom, Australia, New Zealand, and very recently, Canada and the United States (Hill, 2011). Forest school models being implemented in Canada are most popular for preschool and kindergarten age children, however, there is a growing movement, demonstrated by the ground-breaking programs listed below, towards adapting and integrating this approach for older children as well.

- **Maplewood Forest School, Ontario**

Located in Guelph, the Maplewood Forest School offers programs to local schools in the region. They are currently working with three private schools (for example, Echo Montessori Forest School) with children ranging in age from two, to grade three. This program is unique in that it both tailors learning experiences to the specific interests and needs of each group, and makes formal links with the Ontario curriculum in subjects like science, language and math. Skills such as risk assessment, effective communication and problem-solving are emphasized, with a specific focus on

an integrated understanding of the links between concepts. A multitude of learning styles are accepted and valued, and parent participation is encouraged. The school was founded by one individual in 2010, and is the first forest school in Canada to offer programs to both preschool and elementary students. The instructor is also the only person in Canada to have formal Forest School certification (training is only offered in UK). Plans for expansion to include older elementary school students in the program are underway (Mason, 2012; personal communication, March 6, 2012)

- ***Carp Ridge Forest Preschool & Forest Kindergarten, Ontario***

Located in Eastern Ontario at the edge of a 190 acre forest, this program is part of the Carp Ridge Learning Centre, a place where the values of cooperation, respect and empowerment are the basis of learning. The forest school is for preschool and kindergarten aged students, with an approach to learning focused on the individual child, much like the Maplewood Forest School. Students are outdoors almost the entire day, with the goal for children to build a strong foundation in environmental understanding through “imagination, empowerment, increased mobility & motor skills, respect for self and for others, healthy living, and environmental responsibility” (Carp Ridge Learning Centre, 2012). Further, there is a unique emphasis on connecting individuals to each other as well as the natural world, in order to direct attention away from technological approaches to learning. Carp Ridge is the first wilderness preschool in Canada, and plans are in place to expand the program to a forest school for elementary school children in the near future (Carp Ridge Learning Centre, 2012).

- ***Sangster Elementary School Nature Kindergarten, BC (starting September 2012)***

Backed by the Sooke School District and starting this fall, this nature kindergarten will utilize the Royal Roads University forest for half the day, allowing students to interact with and learn about the plant and animal life in both the forest and the lagoon in the surrounding area. The program’s capacity is twenty-two students, with the goal being for children to “develop an appreciation for the environment, spend more time outdoors, and develop a sense of environmental stewardship” (Hill, 2011). Children have access to both an ocean interface and a forest ecosystem in one setting, which provides a unique opportunity for students to learn about the interconnectedness and ecology of systems, within a living laboratory. This project is a unique collaboration between Royal Roads University and the Sooke School District, with others like the University of Victoria, Camosun College, and Royal BC Museum interested in being involved (Krusekopf, 2012).

ii. **Waldorf education**

There are 24 Waldorf Schools throughout Canada, in Alberta, BC, Ontario, Nova Scotia and Quebec, however, space constraints confine the list here. Although the outdoor exposure is often less about forest environments, child-driven experiential learning in the outdoors, and in all subject areas, is fundamental to Waldorf education, and as such, provides an excellent basis for environmental and outdoor education to be embedded into the curriculum.

- ***Sunrise Waldorf School, BC***

Located in Duncan, this school has a strong emphasis on outdoor education in many forms at all grades. The grade three level in particular requires students to be outdoors for large portions of the day, as farming, gardening, building, and other earth activities are a significant part of the curriculum (Sunrise Waldorf School, 2012; personal communication, March 23, 2012).

iii. **Eco-school initiatives**

BC and Ontario are leading the Eco-school initiatives in Canada. In BC, there are efforts such as the *Environmental Learning and Experience Guide (2007)*, a resource designed to aid educators in integrating environmental education into the regular curriculum (BC Ministry of Education, 2007; personal communication, February 15, 2012). In Ontario, the Eco-schools program has certified a total of 1518 schools in 44 school boards (as of 2011); this system should be regarded as a model for what can be achieved in the Canadian public school system. Another initiative is 'school ground greening', where programs like the Evergreen Learning Grounds work to fund outdoor spaces that integrate environmental subjects into student's everyday learning (Ontario Eco-schools, 2006). Examples of schools with the highest level of certification and integration of environmental education are provided below.

- ***Toronto Island Public/Natural Science School, Ontario***

This gold standard ranking Ontario Eco-school offers three programs: a public day school program (enrolment of around 180), a residential science program for grades 5 and 6 (capacity of 68 students), and a nursery (Toronto Island Public/Natural Science School, 2012). Three activity lessons take place per day in the ecosystems of the Toronto Islands Archipelago. Children in the public day school program, aged kindergarten to grade six, commute to school from Toronto's core to the island. The program content focuses on the interconnectedness of humans and the environment at a local and global scale. For instance, one activity block at the grade six level, a

biodiversity hike, allows students to examine the impacts of humans (such as pollution and invasive species introduction) on the island's ecosystems (Island Natural Science School, 2008). The school has a library and resource centre, science labs, a greenhouse, and interesting green technology like a grey water system, solar and photovoltaic panels (Toronto Island Public/Natural Science School, 2012).

- ***Environmental School Project, BC***

A collaboration between community groups, the Maple Ridge and Pitt Meadows School Districts, and Simon Fraser University, this public elementary school program (which opened this September for 60 students aged kindergarten to grade 7) functions almost entirely outdoors. Classes are held in "parks, at picnic tables, alongside streams, under tarps and tents, in gardens, libraries, restaurants, fitness centres, and even municipal council chambers, when they're available" (Landreville, 2012). The formal provincial curriculum is adhered to, but systems connections and integration between subject areas like reading, writing, math and science are fundamental. For instance, activities include studying salmon and tree anatomy in their natural environments. Some of the program's core values are "place and community, nature, ecology and sustainability, inquiry and possibility, interdependence [and] imagination" (Environmental School Project, 2012). Since opening, students have spent only ten days indoors; this type of program may be the only one in Canada (Landreville, 2012).

- ***Holyrood Elementary School, Alberta***

Located in Edmonton, this school of 410 elementary school students was a winner of the 2011 Aviva Community Fund. The money is funding their ongoing commitment to experiential learning, including an outdoor classroom, the space for which has been provided by the destruction of a school parking lot. The outdoor classroom has five raised vegetable garden beds and native plants and trees, among other things. It is used year round as a "living laboratory" by students and teachers. The classroom is just part of Holyrood School's efforts to improve quality of life and build a strong sense of community. The school is located close to a seniors' centre, extended care facility, and group home, and all groups were involved with the planning of the interactive outdoor learning area (Drysdale, 2011).

B. United States

i. Forest Schools

Just as in Canada, forest schools are fairly new to the United States, with most programs for the preschool and kindergarten age rather than older children. In this section I've included programs based on the traditional Scandinavian forest school approach, as well as programs based on the system of 'school forests'. School forests were started in Wisconsin in 1930's, as a movement by school children to replant deforested and denuded areas. Since then, this movement has grown, and forested areas are used across the country by schools to integrate environmental learning into the curriculum (Madison Metropolitan School District, 2012).

- ***Cedar Song Nature School, Washington***

Cedar Song Nature School is the first German style model of forest kindergarten to start in the United States, and offers an entirely outdoor forest kindergarten for children aged three to six. As with the Canadian examples, the approach is based on hands-on experiential learning, where the curriculum and content of learning is based on the interests of the individual children (Cedar Song Nature School, 2011).

- ***Madison School Forest, Wisconsin***

The 400 acre Madison School Forest is an oak forest encompassing over 40 species of nesting birds. Used by many schools in the school district on a regular basis (for example, Lincoln Elementary School), activities and lesson plans are drawn from the area, which serves as an outdoor classroom in which to study ecology of soils, trees, insects and plants (Madison Metropolitan School District, 2009). It is the oldest school forest in the US, and the forest was started from trees planted by students in the 1930's at the beginning of the school forest movement (Madison Metropolitan School District, 2012).

ii. Eco-school initiatives

There is an impressive movement towards the integration of environmental education systems into the public system in the United States, by both environmental organizations and the government. I will look at three examples of this movement: the Eco-schools program, the National Wildlife Federation's (NWF) School Yard Habitat program, and environmental magnet schools. In the US, Eco-schools are certified by NWF. The programs included in this section are schools that have achieved the top standing in the program, the Green Flag Award. The NWF School Yard

Habitat Program is another certification program, started in 1996, which assists schools in restoring the natural land in the surrounding area, with the purpose of creating school grounds that act as “learning sites for wildlife conservation and cross-curricular learning” (National Wildlife Federation, 2010; National Wildlife Federation, 2011b). Environmental Magnet schools are ones with specialized environmental education curricula that allow students to cross normal school board boundaries to attend (US Department of Education, 2010).

- ***Oakwood Environmental Education Charter School, Wisconsin***

This NWF Schoolyard Certified school, started in 2003, is a collaborative project between the Oshkosh Area School District, the University of Wisconsin Oshkosh and the Sheldon Nature Area Ecosystem. The school uses the 26 acre Sheldon Nature Area as a basis for all its learning: this environment is the fundamental basis of the whole curriculum (Oshkosh Area School District, 2006). The curriculum adheres to state standards, and the students consistently rank higher than other states in all academic areas. Kindergarten to grade five students focus on specific environmental concepts (such as waterways, wetlands, or an energy) to enhance basic math, science, literacy, problem-solving and critical thinking skills. For instance, one activity from the concept of waterways has an ‘analysis of stream velocity measurement’ exercise, which is then linked to lessons on nutrient pollutants. The school has won different grants and awards, and is a model in its field (Oakwood Environmental Education Charter School, 2012; National Wildlife Federation, 2010).

- ***Emily Dickinson Elementary and Explorer Community School, Washington***

These two schools, with kindergarten to grade six students, share a unique 1.45 acre wetland ecosystem in their school grounds. The ecosystem contains a meadow, as well as two distinct forested areas, upland and lowland. Both schools are Eco-school and Schoolyard Habitat certified, and children spend a minimum of one hour each week outside in the wetland. Learning about the ecosystem is fully integrated into the curriculum, from restoring the trails and habitats to classroom activities. For example, one grade five class did an assessment of the wetlands and decided on an action plan that involved planting native species and teaching others about the importance of wetlands as pollutant absorbers and wildlife habitat. This program is unique in that it focuses learning on both the forest and wetland ecosystem, and the connections between the two (National Wildlife Federation, 2011a).

- ***Savannah Country Day School Lower School, Georgia***

This school of 400 elementary students was the first to receive the prestigious NWF Eco-schools Green Flag award in 2011. It also has a certified NWF Schoolyard Habitat with outdoor classrooms including vegetable and herb gardens, water catchment systems (used to water the gardens) and composting areas. Every grade uses these outdoor classrooms for a minimum of one hour per week, and the concepts that students learn outdoors are fully integrated into the teaching curriculum. This school demonstrates that full integration of environmental education, including the development of an environmental awareness, knowledge, attitudes, skills and participation can occur even in relatively small ‘natural’ outdoor environments (National Wildlife Federation, 2011b).

- ***Hacienda Environmental Science Magnet, California***

Located in San Jose, this kindergarten to grade five program is “dedicated to teaching students to explore the natural world around them” (Hacienda Environmental Science Magnet, 2012). The school property includes a one acre outdoor classroom with native plant and riparian ecosystems, and the integrated science program at the school is based on these outdoor components. This school’s approach is interesting because, like other environmental science magnet schools, the learning by students includes exposure to ‘natural’ places, but also integrates technology (such as experimental outdoor labs) into the learning as well (Hacienda Environmental Science Magnet, 2012).

V. Suggestions for Future Research and Further Programs of Interest

In order to focus the scope of my research for my community partner, Fresh Air Learning, I excluded many programs that were outstanding, but did not fit my requirements. In particular, I excluded programs that utilized outdoor recreation facilities and were on a short term basis only (just a week or less out of every year). I recommend that research be done to determine the extent to which public schools use and integrate these external facilities, in order to determine how the use of external facilities could be adapted to fit fully within the school’s regular program content. Further, I recommend that more research be done on the wide variety of Eco-school initiatives in BC, as time constraints limited me from researching these in great detail.

In the interest of space, I included one example from each type of approach in this report. Here I have listed notable programs that I did not have room to include in the Results section. In Canada, another Waldorf School of note is South Shore Waldorf School, Nova Scotia. Another Eco-school of

note is Woburn Junior Public School. In the US, other forest kindergartens of note are Dodge Centre Nature Preschool (Minnesota), River Legacy Nature School (Texas) and Wildwood Nature School (Oregon). Another School Forest of note is Laona School Forest, Wisconsin. Other NWF Schoolyard Habitats of note are Frenchtown Elementary, Tuckahoe Elementary School, Nottingham Elementary school and Arlington Science Focus School. Other Environmental magnet schools of note are Oil City Elementary Magnet School (Louisiana), Earhart Environmental Magnet Elementary School and Barnard Environmental Studies Magnet School.

VI. Conclusions and Recommendations

A large-scale movement towards the integration of environmental and outdoor learning into the kindergarten and elementary school curriculum is taking place, in a multitude of forms. In this report, I identified specific forest schools, Waldorf schools, and Eco-school initiatives at the forefront of this movement. My research has confirmed that environmental education at the preschool and kindergarten level (and at the high school level, although that is beyond the scope of this report) is flourishing, but that there is still work to be done when considering the inclusion of environmental education into the public elementary school system in Canada. Waldorf schools already have a stable basis in North American educational culture, and Eco-school initiatives are fast gaining ground. Conversely, forest schools modelled after the Scandinavian concept are only just beginning to be implemented in North America (with both Ontario and BC as leaders). Forest schools were originally based in early childhood education. One of the main challenges to implementing forests schools at the elementary school level and higher in North America seems to be the perceived disconnect between students 'experiencing nature' and at the same time realizing the official structured curriculum learning requirements. However, there is growing understanding of the benefits forest school can bring to older students. Through the examples provided in this report, I have shown some of the innovative ways throughout North America that this perceived disconnect is being bridged by elementary school students and teachers, with fantastic results. Based on this conclusion, I recommend the following.

- *For the wider Fresh Air Learning network:* I recommend that this research be distributed to parents and educators, so that connections between programs can be made and resources can be shared. Further, I recommend that this research be used by parents when considering options for their child as they move from preschool programs like Fresh Air Learning into the rest of their education.

- *For the Canadian public and private school systems, including parents, educators and advocates of environmental and outdoor education in general:* I recommend that the examples of outstanding programs I have included in this report be used as models for positive change within the Canadian school system, especially the public system. For example, implementing outdoor classrooms makes excellent use of existing space in urban and rural areas, and can provide a wide range of opportunities for environmental and outdoor education when large forest areas are not readily accessible. The programs included in this report provide examples of the ways that environmental education can be feasibly integrated into public schools (wherever a school is located and whatever attributes it has) as well as the incredible results that relatively simple changes can have on student learning.

In the words of the United Nations Environment Programme, “Only through education can we hope to alter fundamentally widespread patterns of environmental abuse... the health of the environment depends on the degree to which individual citizens participate in the decisions that rule their lives.” (Fuks, 2004, p. 9)

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