Greening Play Spaces

Restoration of University of Victoria Childcare Services Centre 3, Complex A

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ES 341

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Table of Contents

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Introduction

Ecological Restoration recognizes the long-standing interrelationship between humans and the environment (National Parks Directorate, 2008, p.2). However, contact with natural elements in outdoor play areas is a vanishing experience for both children and adults. As more and more people are living in cities and urban landscapes, a crucial part of human development is lost: the ability to recognize one's true place in nature.

Nature-deficit disorder, is defined by "Last Child in the Woods" author Richard Louv, as the cumulative effect of withdrawing nature from children's experiences. However it is not a clinical diagnosis, nature-deficit disorder has detrimental effects on entire communities. Increased levels of stress, the inability to pay attention, and feelings of displacement from the rest of the world are all symptoms of withdrawal from nature. For many children as well as adults, modern society has produced a degraded natural environment that offers fewer and fewer opportunities to experience fulfilling contact with nature as part of an ordinary life (Kellert, 2005). Climate change, air and water pollution, loss of natural habitats as well as the destruction of biological diversity have resulted in threats to nature's role as an essential medium for our emotional, intellectual, and moral development (Kellert).

Children spend between forty and fifty hours per week in institutional, commercial, and other out-of-home care situations (Herrington and Studtmann, 1998). It is within these out-of-home situations where children have the potential to re-establish a connection with the natural world. Restorative environmental design, also referred to as biophilic design, is the innovative approach to the design and development of the human built environment (Kellert, 2005). It focuses on how we can avoid the excessive consumption of energy and resources which generate vast amounts of waste; while at the same time avoiding the alienation of people from the natural world. This design process can be implemented in schools, community centers, and almost all structures that currently lack a feeling of naturalness.

In many cases ecological restoration encourages and may be dependent upon long-term participation of local people (Society for Ecological Restoration, 2004, p. 2). Community involvement is required for creating a successful restoration design that will be sustainable in the long term. Parents, children, teachers, students, and all members of society have the potential to restore naturalness to the cultural landscape. By re-establishing the vital human connection with nature, we have the ability to ameliorate damage already made to natural systems and enrich our bodies, minds, and spirits in doing so.

Site Background

Much of the Victoria area, including Esquimalt, the Gorge, Cordova Bay, Cadboro Bay, Portage Inlet, and numerous other areas within the region, was originally inhabited and traversed by a Coast Salish Ethnic Group of indigenous peoples (Bryce and Sam, 1997). This group comprises smaller family groups who share the Lekwungen dialect. The Chekonein family group resided within the Cadboro Bay area and inhabited and journeyed through what are today the University of Victoria campus grounds (Turner, 2002).

The university's childcare facility was initially set up in 1969 by student parents requiring the service in 1969. In 1996, the Caring for the Future Campaign was established to raise funds for expansion ("Childcare seeks," 1997). Today the childcare facility consists of three units: complex A, complex B, and The Harry Lou-Poy complex. The Harry Lou-Poy complex was established in 2001 and named after the sponsor of a generous donation towards further childcare services expansion ("Newest childcare," 2001). This project proposal will focus its efforts on Centre three, Complex A, established in 1994. This centre cares for children from ages 18 months to 3 and a half years.

Site I.D.

The University of Victoria's Child Care Centre three, Complex A is located a few minutes from campus along Finnerty Road (See Appendices A and B). The centre provides care services for the children of University faculty, staff and students. Care is provided for sixteen children ages eighteen

months to three years. Our specific restoration site is located outside Centre 3-Complex A in the children's play area.

The perimeter of the play space is 106.11m, providing the children with a fair sized area to frolic in during play time. Adjacent to the outdoor playground is Haro Woods, which offers the site a great deal of shade. Staff have voiced concerns over the sharp dip leading into the woods, which poses a safety hazard for the children and explains the fencing around the area. Two manufactured play structures, a swing set and jungle gym, are surrounded by pea gravel take up the largest amount of space in the outdoor play area. The site is characterized by an abundance of cement surfaces, creating a dull, grey environment. Visual stimulation is provided only by bursts of plastic reds and yellows. One cannot help but wonder what the site would look like with the addition of natural vegetation, trees, and flowers.

The staff of Child Care Centre Three aim to provide a warm, nurturing environment in a home-like setting to facilitate all aspects of child development. Recently, the staff have expressed a desire to establish a more natural setting in the outdoor play centre, allowing children a more integrated experience with nature. Currently there are mint and raspberry planters, vegetable planters, and a planter box containing only soil (See Appendices C and D for complete inventory and map of existing conditions). Staff members have noted how the children greatly enjoy playing in the soil, satisfying themselves for hours on end. Although these features are diminutive in scale, they represent the staff's desire to incorporate natural vegetation into the play area. This is just one step towards re-establishing children's connection with nature.

Problem Identification

Interaction with nature is diminishing as more and more people are moving to urbanized settings and are leading increasingly sedentary lives. An increasing number of families are enlisting their children in out-of-home care situations as busy work schedules increase the need for non-parental child

supervision. It is absolutely vital that child care establishments provide their kids with outdoor play areas that incorporate vegetation and other naturally occurring materials.

The natural environment plays a vital role in any person's life, regardless of age. However the most critical period in human development is during childhood (Kellert, 2005). Young people need to be engaged with the natural world consistently and in various ways to mature effectively. Robin Moore (2007), a professor of landscape architecture, believes that playgrounds incorporating natural components of the environment such as trees, vegetation and flowers encourage children to play more actively and learn more fully about themselves. In his book *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder,* the chairman of the Children and Nature Network Richard Louv (2008) cites Moore: "[N]atural settings are essential for healthy child development, because they stimulate all of the senses and integrate informal play with formal learning" (p. 87). Children's learning is maximized through the process of self-directed exploration and discovery, increasing cognitive stimulation. Many communities are concerned that children are spending less time exploring the outdoors and more time indoors staring at the television or computer screen. Urbanization has deprived children of natural sensory stimulation. This lack of access to natural surroundings is adding to an increasingly sedentary lifestyle. Because young children's intellectual, emotional and moral capacities are rapidly developing, they stand to lose the most from a disconnection with the natural environment (Kellert).

This proposal seeks to establish an efficient restoration design for Child Care Centre Three-Complex A, which incorporates aspects of the natural environment that encourage the children to develop more multifaceted physical and cognitive skills.

Restoration Goals and Objectives

This restoration initiative is guided by an overarching mission statement comprising the project's goals: to design and implement a natural play space encouraging children's cognitive and physical development though environmental engagement.

1) **Goal One**: Outline a series of options for the fenced in grassland area
    a) **Option One**: Treat soil and plant native garden
    b) **Option Two**: Replace affected area with recycled absorbent matting
    c) **Option Three**: Install manufactured drainage system
2) **Goal Two**: Engage and challenge children with a natural landscape
    a) **Objective One:** Incorporate a varied terrain
    b) **Objective Two**: Create a winding tree stump path to help develop motor skills
    c) **Objective Three**: Replace the manufactured play structure with a hill
3) **Goal Three**: Develop an area with emphasized environmental and cultural awareness to stimulate growth and development
    a) **Objective One**: Plant a native garden, and native vegetation throughout the playground
    b) **Objective Two**: Incorporate a composting centre
    c) **Objective Three**: Plant a vegetable garden
    d) **Objective Four**: Create 'vegetative rooms' to provide quiet spaces for individual time and reflection

Methods

Implementation Plan

Implementation of objectives will be carried out in two phases. The two phase process separates features that can be implemented in the first six months of restoration, from those that will be put in place after the six month mark. Design elements are applied either in phase one, or phase two, based on their level of permanence and implementation time. Phase one features will "green" the landscape immediately, without disrupting the structural and functional integrity of the landscape. During this restoration phase, children will enjoy full access to the play site. Because these features are easily executable, children can help participate in activities such as planting or compost maintenance. Phase two features require a longer time period for implementation, and will ultimately become permanently integrated into the landscape. See Figure 1 for phase one and phase two classifications.

Implementation Phase	Phase One	Phase Two
	Potted Native Plants	Hill
	Logs	Grassland Restoration
	Rocks	Logs Around Sandbox
	Compost Centre	Native Plant Garden
	Vegetative Dividers for Quiet Space	Vegetable Garden
		Stump Pathway

Figure 1: Classification of design features as either phase one or phase two.

It should be noted that the timeline for implementation of design features is meant to be a guideline for restoration. Timing of implementation should firstly reflect the centre's needs and capabilities.

Factor's affecting implementation times may include the following:

- Weather constraints,
- Funding availability,
- Material availability, and
- children's access to the landscape.

Detailed Implementation of Goals and Objectives

1) Outlining Goal One: Outline a series of options for the fenced in grassland area

- Restore grassland with soil treatment and native plants, vegetables and grasses
- Place recycled tire mats over area
- Put in an effective drainage system

The fenced, grassy area located within the play area goes unused for 8 months of the year: water build up on the land, leads to mud, and very messy children. A wooden fence separating the area from the rest of the play space was built to keep the kids off the grass. Jack Lalonde, Centre Manager, tried to address the issue by applying for a grant to fund a new drainage system. Unfortunately, he was unsuccessful. Our mission is to restore this natural area, giving the children a place to interact with nature void of plastic. According to the Canadian Standards Association for Playground safety, garden plots should be made available to school-age children wherever possible. The supervision of children is important as garden tools are distributed and the plots are watered. A knowledgeable adult on safe garden techniques and native plants would be the most beneficial (CSA, 2003).

a) Implementing Option One: Treat soil and plant native garden

In order for native plants to survive the soil must be adequate to support life. Therefore soil testing is critical before planting. Through research we have discovered wet soils are anaerobic, oxygen limited; therefore, other oxidizing agents must be used for respiration. Wet soils have high thermal conductivity and admittance, so are able to accept, release and conduct heat better than a dry soil area

(UBC SoilWeb, 2008). In other words, wet soils can facilitate more productive, efficient photosynthetic processes than dry soils.

The fenced off, grassy area currently consisting of mosses and clover, requires soil treatment before vegetative features can be implemented (See Appendix C). We suggest placing a mulching treatment down on the grass, followed by a layer of topsoil containing native grass seedlings. After the grass propagates, native plants and foliage will be planted, and help maintain the excess amounts of water. This method is more cost effective than purchasing and laying sod (Seedland, 2008). The soil produced by the compost can be used as mulch for the grassy area. The amount of compost may not be sufficient for the entire landscape so purchase from a farm, nursery or warehouse may be required.

The primary objective of option one is to restore abiotic conditions. In order to do so, biotic conditions must first be implemented, as they are a more effective regulator of a natural system. Abiotic processes include soil stability, hydrology and nutrient dynamics whereas biotic processes include the dynamic of plant availability, plant-plant interactions, soil microorganisms, herbivory and spatial oriented dynamics such as the effects of habitat fragmentation (Hobbes and King, 2006). The introduction of native facilitator plants is part of the solution to the wet grassland section. These plants help the success of the plants surrounding them through biotic interactions by improving soil structure, increasing water infiltration, enhancing soil retention, preventing erosion, contributing nutrients and controlling nutrient cycling (Evergreen, 2008). Higher root plants are more efficient in soaking up water but tend to be quite large therefore use in this project design is somewhat restricted (UBC SoilWeb, 2008). See Appendix E for the proposed layout of the grassland area. Refer to figure two, below, for an inventory of native plant species suitable for this restoration option.

Name	Scientific Name	Height	Soil Attributes	Growing Conditions	Food, Flowers, Animals
Saskatoon Berry	Amelanchier alnifolia	1-5 m	Moist	dry, normal or moist moisture,	Edible berries, attracts birds, butterflies,

				sun/ partial shade, clay soil	shelter for small mammals, white fragrant flowers
Vanilla Leaf	Achlys triphylla	30cm	Moist, high organic matter	Prefers shady areas, good understory for a berry bush	White flowers, dried leaves smell like vanilla, repels insects
Salmonberry	Camassia quamash	Up to 4 m	Clay, sand, loam	Moist climate, partial shade or sun, good in a wet meadow	Edible berries, colourful flowers, attracts birds and insects
Common Camas	Camassia quamash	60-120cm	Heavy soil, moist	Sun or partial shade	Meadow plant, blue or white flowers
Cascade Penstemon, Coast Penstemon	Penstemon serrulatus	45-60 cm	Moist	Wet climate, sun to partial shade	Attracts hummingbirds, purple-pink flowers
Golden-Eyed Grass	Sisyrinchium californicum	45-60cm	Requires consistently moist soil	Wetlands, low elevation, sun to partial shade	Bright yellow flower in late spring to early summer
Red Osier Dogwood	Cornus stolonifera	1.5-4m	Damp soil	Wetlands, does well in poorly drained soils	Small white flowers, white berry
Indian Plum	Oemleria cerasiformis	1.5-15m	Soft, not too drained, moist	Sun to partial shade, particularly vulnerable to wind and climate as a young specimen	White winter flowers, attracts hummingbirds, birds and butterflies
Arctic Lupine	Lupinus arcticus	20-60cm	Moist	Sunny areas	Clusters of blue flowers

Figure 2: Native plant inventory for restoring grassy area (option one)

b) Implementing Option Two: Place recycled tire mats over area

This method is not favourable from an environmental perspective as it involves removing the little green area within the playground and replacing it with something manufactured. However, it does provide the children with a large area to run and play that they currently do not have available to them. A range of companies offers the sale and installation of recycled tire mats. The cost varies depending on company, matt colour and depth.

BounceBack is a fairly reasonably priced and safety conscious company providing waterproof, easy to clean surfacing in a variety of colours and designs. The surfacing is composed of three layers: a draining, base, and wear layer (BounceBack, 2007). The depth of the wear layer depends on the critical height fall outlined in the Canadian Standards Association for Playground Safety. The critical height fall is determined by the height and age of the children who use the equipment. The surfacing should extend 1.5 metres away from the play structure on all sides. A general guideline is to limit the playground structures to a maximum height of 5 metres (CSA, 2003).

Native plants can be incorporated into the area within potted plants. This allows children to help with planting. They should be colourful, manageable and safe for the children to touch. The native Globeflower and Evergreen Violet are two options that would satisfy these conditions. See Appendix F for layout of proposed grassland area. Refer to figure three, below, for an inventory of native plant species suitable for option two.

Name	Scientific Name	Height	Soil Attributes	Growing Conditions	Food, Flowers, Animals
Globeflower	Trollius laxus	10-50cm	Wet, moist	Blossoms after snow recedes	Greenish white to creamy white flowers
Evergreen Violet	Viola sempervirens	8 cm	Moist	Semi-shade or full sun, low to	Yellow flowers

				middle elevation	with purple veins, edible

Figure 3: Native plant inventory for restoring grassy area (option two)

c) Implementing Option Three: Install manufactured drainage system

There are several ways to install an effective drainage system. The first method requires an alteration of the grassland's topography, allowing water to move down a slope into the Haro Woods Ravine. A slight hill would be constructed on the landscape, preventing water stagnation on the current landscape. Possible problems could arise with soil erosion that could occur after heavy rainfall, or from a slope that is too steep. The layout for native plant distribution on the land would be similar to the map produced for option one (See Appendix E).

The second method involves installing a drainage system in the playground area. These systems place fabric between the soil, rocks and grasses and a layer of wood. The water moves through the wood layer, and is then channelled by the fabric strips. The wood layer dries more quickly, and gives children more play time. The cost for a drainage system materials and installation ranges from $2000 to $5000 dollars depending on the system and size of playground (The Fiber Group, 2009). The layout of native plant species used in option two can be used with this alternative method (See Appendix F).

2) Outlining Goal Two: Engage and challenge children with a natural landscape

Children's play places require a sufficient amount of space to facilitate opportunities for exploration. Many of the current play structures found in Child Care Centre Three are manufactured and offer little variation. Children are limited in how they can engage with the structure; when they tire of using the structure in one way, they start to use it in unsafe ways. As a safety measure, flat surfaces surrounding play structures must be both accessible, and able to absorb shock should a child fall from a structure. Currently the pea gravel around the jungle gym and swing set provides this function. Half of

the pea gravel surrounding the current play apparatus will be removed; however, because the swing set will remain, so will the gravel surrounding it.

a) **Implementing Objective One:** Incorporate a varied terrain

The playground's topography should be analyzed in order to justify a varied landscape. By removing the current playground apparatus, the play area will become much larger. The equipment will be replaced by a mixture of slopes and dips. Multiple routes and access points to different areas of the play place provide pleasant surprises and mental stimulation. A hill will also allow the children to explore their balance and center of gravity in an engaging and playful manner. This will restructure the playground in a way that will stimulate the children's minds, and ensure continued engagement with the landscape.

b) **Implementing Objective Two:** Create a winding tree stump path to help develop motor skills

A landscape-based approach to designing a children's play space satisfies specific development milestones. Specific landscape situations ensure that the playground provides for physical development as children make their way through their surroundings; however the design must also leave room for emotional and cognitive development as well.

Tree stumps of varying heights will create a meandering pathway on the grassy area, adjacent to the swing set. This will allow the children to develop their motor dexterity, a sense of direction, and ordering skills. By manoeuvring through the playground along a serpentine path, the children will learn through exploration and adventure.

c) **Implementing Objective Three:** Replace the manufactured play structure with a hill

The topography of the playground should be analyzed to provide for a varied landscape. By removing the current playground apparatus, the play area will become much larger. The equipment will be replaced by a mixture of slopes and dips. Multiple routes and access points to different areas of the

play place provide pleasant surprises and mind stimulation. In addition, a hill allows the children to explore their balance and center of gravity in an engaging and playful manner. This will restructure the playground in a way that will stimulate the children's minds, and ensure continued engagement with the landscape.

3) **Outlining Goal Three:** Develop an area with emphasized environmental and cultural awareness to stimulate growth and development

Children's learning is maximized through the process of self-directed exploration and discovery. Physical interaction with elements of the natural environment helps establish positive emotional and cognitive skills, especially within young children. Natural, leafy vegetation, flowers, birds and animals encourage children to explore more and to learn much about themselves and their surroundings. Human physical, mental, and spiritual well-being depends on the opportunity to engage oneself in diverse natural systems. By placing low, leafy plants within the playground, children are able to interact with natural flora.

a) **Implementing Objective One:** Native plant garden and native vegetation throughout playground

Native shrubs, perennials and small trees incorporated into the landscape will create a diverse, interactive and visually stimulating atmosphere for the children to explore, interact and participate in. The students will become educated and involved with seeding, watering and fertilizing the native vegetation. The use of native and culturally significant plants will expand the number of ways in which children can relate to their environment, emphasizing historical, cultural and ecological values. By helping to plant native vegetation, we hope the children develop a stronger connection and respect for their natural surroundings. See figure two for an inventory of possible native plant species.

b) Implementing Objective Two: Incorporate a composting centre

A composting system will be implemented in phase one of the restoration design. We recommend the Vermi compost system which uses worms break down food waste. The compost bin has a self-drainage system in order for the worms to stay moist while creating a nutrient rich fertilizer for the plants and vegetable garden within childcare centre. This style of compost introduces an educational component into the play area, and helps engages children in the composting process. They are able to learn about decomposition, recycling and ecological processes as they get their hands dirty and engage with nature. The Vermi compost system costs $42.95 from the Greater Victoria Composting Centre (2009).

c) Implementing Objective Three: Plant a vegetable garden

A vegetable garden is an important aspect of greening a playground. It requires faculty and student maintenance, thereby increasing the level of interaction and environmental education. Children will gain insight into where their food comes from, while learning about the importance of organic, locally grown and sustainable food. A vegetable garden was previously proposed in goal one, option one. If option two is chosen for restoration of the grassy area, a vegetable garden will not be included into the design. Edible plants, such as Saskatoon berry bushes, and an apple tree will be implemented throughout the landscape as a substitution for the lack of native vegetable garden. Space availability is the reasoning behind this choice.

d) Implementing Objective Four: Create 'vegetative rooms' to provide quiet spaces for individual time and reflection

The play space of Child Care Centre Three is currently an open area with room for the children to roam freely and interact with one another. Unfortunately, there is no space dedicated to peace and tranquility. Children need to be able to remove themselves from the noisy playground, so they are able

to have individual quiet time. *Rubus parviflorus* (Thimbleberry) will be planted next to the two picnic tables, and allowed to grow up two trellises. The “green wall” will create a natural divider, separating the picnic tables from the rest of the play space. The trellises will act as a doorway into a place designated for quiet time activities such as reading and drawing. The result will be a sub-space within the larger playground. Two tires will be placed in between the picnic tables and the sand boxes, acting as planters for *Cornus stolonifera* (Dogwood). The children will now be able to seek peace and quiet, with the natural vegetation offering a calm and peaceful sanctuary.

Budget

The following three figures summarize possible basic cost outlines for the main features of our design. For a more detailed breakdown of costs see Appendix G.

	Cost (in Canadian dollars)
Vermi Compost	42.95
Recycling Bins	45-50
Soil	150
Seeded lawn	4
Tree stumps	45
Removal of pea gravel	480
Removal of play structure (labour)	1800
Medium sized logs	2400
Wooden wind chimes	66
Pacific Crab Apple Tree	9
Trellis-straight and circular	240
Saskatoon Berry	24
Vanilla leaf	36
Salmonberry	32
Common camas	12
Cascade Penstemon	48
Golden-Eyed Grass	12
Red Osier Dogwood	48
Indian Plum	7
Arctic Lupine	17.50
Total Estimated Cost	**5520.95**

Figure 4: Individual and aggregate costs of implementing restoration using grassy area option one

	Cost (in Canadian dollars)
Vermi Compost	42.95
Recycling Bins	45-50
Soil	150
Seeded lawn	4
Tree stumps	45
Removal of pea gravel	480
Removal of play structure (labour)	1800

Medium sized logs	2400
Wooden wind chimes	66
Pacific Crab Apple Tree	9
Trellis-straight and circular	240
Golden-Eyed Grass	12
Evergreen Violet	19.50
Globeflower	12
100% Recycled Surfacing	1437.16 - 2436.03
Total Estimated Cost	**6764.61 – 7763.48**

Figure 5: Individual and aggregate costs of implementing restoration using grassy area option two

	Cost (in Canadian dollars)
Vermi Compost	42.95
Recycling Bins	45-50
Tree stumps	45
Removal of pea gravel	480
Removal of play structure (labor)	1800
Medium sized logs	2400
Wooden wind chimes	66
Pacific Crab Apple Tree	9
Trellis-straight and circular	240
Drainage system	2000-5000
Globeflower	19.50
Evergreen Violet	12
Cascade Pensteman	18
Total Estimated Cost	**7179.45 – 10,179.45**

Figure 6: Individual ad aggregate costs of implementing restoration using

We recommend the following solutions for reducing implementation costs. Firstly, expenses for soil, mulch and seeds could be eliminated by a donation from an organic farm, from parents, or from the University. Secondly, environmental studies or geography classes could help participate in restoring the grassy area, thus diminishing the labour costs. The overall cost of native plants and restoration can be reduced by applying for funding with Evergreen, a company that specializes in funding greening

playgrounds for children. All information for Evergreen's funding is available online at www.evergreen.ca. Fundraising for the project is another method to reduce cost. Fundraising initiatives could include bake sales, donations from families or friends, or barbeques.

Monitoring Plan

The goals and objectives outlined in the introductory section of this report are the referents for carrying out a successful design, implementation and assessment of restoration at Childcare Centre A. To that end, our monitoring plan is predicated around two questions outlined in the *SER International Primer on Ecological Restoration*: "Were the objectives accomplished? Were the goals fulfilled?" (Society for Ecological Restoration, 2004, p. 10). This will ensure continuity between goals, implementation, management and monitoring as the site restoration unfolds. Monitoring will address these questions using an adaptive management approach facilitating "engagement, learning and visitor experience" (National Parks Directorate, 2008, p. 63). All efforts should be made to integrate stakeholders into the monitoring process: qualitative feedback will be gathered in interviews with centre management, educators, parents and children. Interviews will be conducted after each phase of implementation, and as part of a long term management strategy. To ensure effective communication between restorationists and stakeholders, the handbook on *Principles and Guidelines for Ecological Restoration* recommends reporting "[b]oth successes and failures […] to encourage ongoing learning and refinement of restoration techniques and processes" (p. 64). Open communication lines are essential for carrying out successful interim and long term monitoring.

Interim Monitoring

Intermittent checkpoints and interviews are the first phase of monitoring, and will ensure site goals and objectives are met during implementation. Stakeholders should be consulted at regular intervals during the design and implementation process. Their feedback will guide the continued or adapted course of the restoration project. These checkups give stakeholders a chance to provide feedback, and either affirm or challenge the design implementation. Additionally, early problem ID fits within the adaptive management framework. It builds flexibility into the restoration strategy, making it more amenable to stakeholder's interests and concerns. See Figure 7 below, for an interim monitoring

framework. Remember, the recommendations for interim monitoring provide a framework, but the monitoring strategy should be adapted to address problems as they arise, or incorporate additional stakeholders into the monitoring plan.

Interim Monitoring Framework	Following Implementation of First Phase Design Features	Following Implementation of Second Phase Design Features
Participants	Members of Childcare Group B; management and educators from Childcare Centre A; parents; children from centre A	Members of Childcare Group B; management and educators from Childcare Centre A; parents; children
Purpose	To determine if the first phase of design features meets goals and objectives; to incorporate stakeholders' concerns or suggestions into second phase of design features	To determine if the second phase of design features meets goals and objectives; to identify stakeholder's concerns and suggestions; to assess if second phase design features are meeting stakeholder's expectations
Method	Roundtable discussion with management, educators and parents; interviews with management, educators and select parents; observe children at play	Roundtable discussion with management, educators and parents; interviews with management, educators and select parents; observe children at play
Suggested Interview Questions	• Were goals and objectives satisfied? • Are children engaging with the first phase features? • Have educators been able to integrate the features into their classroom learning? • Are there any safety concerns?	• Were goals and objectives met? • Is the topography/surfacing challenging children in their play? • Are there any safety concerns? • Have problems arisen with the first phase features?

Communication	• Suggestions for implementing phase two features? Report and discuss findings with stakeholders	• What have been the most successful design elements? Report and discuss findings with stakeholders

Figure 7: Interim Monitoring Strategy Framework

Long Term Monitoring

Continued site monitoring and stakeholder consultation should take place after all design features have been implemented. Part of engaging stakeholders in the restoration process, is ensuring that communication continues even after the site is completely restored. With a long term assessment plan, restorationists can assess plant community survivorship, and can gain a more accurate snapshot of how both children and educators have adapted to their new play space. Monitoring should be conducted via interviews and consultation with parents, educators and management of Childcare Centre A (See Figure 7). It is recommended that these take place at the six month, one year and two year marks after restoration is complete. Formal consultation would most likely be phased out at the two year mark, but could continue at stakeholders' request. The suggested framework for long term monitoring is outlined below in Figure 8.

Long Term Monitoring Framework	6 Months Post-Restoration	1 Year Post-Restoration	2 Years Post-Restoration
Participants	Members of Childcare Group B; management, educators, parents and children from centre A	Members of Childcare Group B; management, educators, parents and children from centre A	Members of Childcare Group B; management, educators, parents and children from centre A
Purpose	To assess plant survivor ship; to determine if goals are still being met; to address stakeholder concerns and satisfaction	To determine if children are still challenged by the play space; to address stakeholder concerns and satisfaction	To meet with stakeholders and determine overall success of project; to make recommendations for continued

			management of play space
Method	Interviews with management, educators and parents (See Figure 1 for suggested questions); observe children at play,	Interviews with management, educators; observe children at play	Interviews with management, educators; observe children at play
Communication	• Discuss successes and failures with stakeholders • Provide written summary of findings and recommendations	• Discuss successes and failures with stakeholders • Provide written summary of findings and recommendations	• Discuss successes and failures with stakeholders • Provide written summary of findings and recommendations • Determine the need for continued consultation

Figure 2: Framework for long term monitoring strategy

Conclusion

Discussion

The budding field of ecological restoration is slowly gaining notoriety amongst land managers, experts and politicians as a viable approach to preserving ecosystem "health, integrity and sustainability" (Society for Ecological Restoration, p. 1). In 2007, Parks Canada (2007) published the *Principles and Guidelines for Ecological Restoration in Canada's Protected Natural* Areas, "the first-ever Canada-wide guidance for ecological restoration practices" (National Parks Directorate, foreword). It seems that the stigma of inferiority that commonly accompanied restored systems is beginning to fade. As land managers, politicians, and experts simultaneously acknowledge the need to combat climate change industrial land use and habitat degradation, it would appear that the ecological restoration controversy has lost its footing. While the decision to practice ecological restoration has in theory gained widespread approval, the discipline is still fraught with controversy over questions of why, what and how we should restore. It seems that policymakers, experts, land managers and the wider community contribute to the intertwining moral, political and ecological values that shape the trajectory of a restoration project. Because restoration is most likely to be successful when carried out through collective, rather than unilateral decision making, it seems that conflicting inputs and debates are inherent in the restoration process.

This discussion will address one of the most contested issues in ecological restoration, and the implications of this debate for our own restoration design. Restorationists are frequently at odds over the question of whether or not restored ecosystems are also 'natural' ecosystems. In *Earth Repair* (2005), March Hall discusses two prominent, opposing views on the debate. The first is given by philosopher Eric Katz, who calls restoration, "the big lie" (Hall, p. 195). He argues that restored landscapes are nothing more than "a technologically created nature," manipulated and engineered by humans. However, this argument implies that humans cannot exist as a part of nature, only above or

outside of it, and that a 'natural' landscape free of human presence is superior to a restored system. Hall also gives space for John Zenter's rebuttal, in which he notes that "all landscapes are to some degree altered by human effects" (p. 195). When this argument is considered, it appears that the distinction between 'natural' and 'non-natural' is a false dichotomy, not an accurate indicator of ecosystem health, functionality and integrity (Hall). Both of these views on naturalness in ecological restoration, can be read into our restoration design for Childcare Centre A, Complex 3.

Our overarching mission statement for this project is to design and implement a *natural play space* that encourages children's cognitive and physical development though environmental engagement. In our meetings with management and educators at Childcare Centre A, the need for a more natural play environment was a common thread in our discussions. References to natural spaces, or the natural environment, frequently appear in the restoration literature, and can describe anything from a manufactured playground, to a forested area (Moore, et. al, 2007; Fjortoft & Sageie, 2000). Although we continually refer to the play area as a natural space, it is important to remember that in this restoration project, more so than in most, human decision, not system dynamics, decides how the system will take shape. As restorationists, we were able to exclude parts of nature that were not suited for the space, and determine the arrangement and use of other materials we did include. In our introductory section we outlined the many benefits of natural play spaces; however, when we talk about 'natural' areas, we must also appreciate the extent to which the area has been designed and manufactured to produce a benign, friendly depiction of nature that suits human needs and interests.

This discussion is not meant to discredit the benefits of natural play spaces; rather, it draws attention to how 'greening' a play space is also steeped in the 'nature' versus 'manufactured landscape' debate. It must also be remembered that creating a natural system is not the only aim of restoration. This project exemplifies restoration's ability to reconnect the public, stakeholders and restorationists with the place they are restoring. Ultimately, restoration must "create opportunities for meaningful

engagement and experiences that contribute to deeper understanding and appreciation [... of] these special places" (National Parks Directorate, 2007, foreword). Although the restored play space will be marked by human influence, it will also facilitate children's exploration, play, and interaction with materials and structures they might not otherwise find in their day-to-day lives. The restorationists of Childcare Group B acknowledge the limitations of a manufactured play environment, but find that this restoration project exemplifies the interconnectedness between humans and the environment. Successful restoration can, and must be carried out even in areas that are not deemed to be 'natural,' or 'pristine.' To that end, we have designed our natural play space not to measure up to an arbitrary definition of nature, but to meet the needs of the children, management and educators at Childcare Centre A, Complex 3.

Recommendations and Further Research

We recognize and commend the educators and management at Childcare Centre A for their efforts to integrate environmental initiatives into both structured and unstructured learning times. This restoration design is meant to foster children's further engagement and connection to surrounding ecosystems. It is our hope that the new play space will provide a stepping stone for continued interaction with the natural environment. The following is a list of recommendations for ways to expand upon the values propagated with this project:

- Expose children to different, comparatively unmanaged systems such as Finnerty Ravine and Haro Woods;
- Implement Phase I features in different seasons to reflect the dynamism of environmental systems;
- Phase I features such as rocks, native plants in planters, sticks, can be moved around the landscape for constant variation;
- Encourage parents to do outdoor activities with their children;

- Discuss the reasons for ‘greening’ the play space with parents; and
- Involve kids in initiatives such as planting, tending the garden, or working at the compost centre,

Group Reflection

In designing this project, we were exposed to the challenges of creating an ecological restoration proposal. After reflecting on the experience, we have determined that successful ecological restoration depends on the collective effort of a group of people concerned with an urbanized or degraded landscape. Through linking ideas, comparing notes, and meeting together on a regular basis our group was successful in creating a design proposal to be implemented at the University of Victoria's Child Care Centre 3-Complex A. The centre is a beautiful, colorful building nestled into the outer rim of Haro Woods. Unfortunately, a large amount of pavement, fencing, and other monotonous, manufactured elements of the centre's outdoor play space have resulted in an area vacant of natural vegetation. The children's area requires a restoration design in order to re-establish a positive interaction with nature; one that is monumental for child development. Urbanization and modern structural design has stripped the centre of any natural, native vegetation.

A critical aspect of the creation of this design proposal was the coming together of five students from different faculties of the University. Child Care Centre Group B consists of students from Geography, Political Science, Economics, and Spanish Language backgrounds. As each group member has different skills and areas of particular interest, this played a pivotal role in the development of the proposal. Not only were new acquaintances made, a bond was forged that encompassed each student's desire for re-establishing our society's fading connection with the natural world. This is but one example of how ecological restoration is trans-boundary, and can be carried out on the cultural and ecological level.

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