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PROPOSAL

Outlined within the following pages is the plan for a small act of focal restoration. We are recommending the installation of a medicinal native plant garden near the new Center for Athletics, Recreation and Special Ability (CARSA). Currently the site in question is less than inspiring, a grassy slope with a few trees. We propose to transform the lawn into alluring and engage space, which can facilitate education, health and well being and stewardship. Features of the site will include an information kiosk and binder of species’ profiles, helping to inform visitors about the plants as well as the site history; a winding pathway through the garden beds, promoting exploration and engagement; and a bench, allowing patrons the opportunity for a quiet moment of relaxation. As for the plants themselves, a range of species have been selected on the basis of the medicinal properties their ease of use. This will allow even novice harvesters the chance to foray into the world of medicinal plants. The central focus of this project is participation. Actively participating with the environment in the context of medicinal plants can encourage healthy lifestyle choices, environmental stewardship and an appreciation for historic landscape. While this project may not necessarily be restoring ecological integrity it does have the potential to help restore our relationship with the environment.

SITE ANALYSIS

ECOLOGICAL AND PHYSICAL SETTING

Our ecological restoration site is located on the University of Victoria’s campus land on Vancouver Island, British Columbia. Receiving an average annual rainfall of 608 millimeters and a mean annual temperature of 9.6 degrees Celsius, Victoria is considered to be the driest and sunniest location on the British Columbia coast (Environment Canada n.d.).

The specific site of our restoration plan is an area near the new Centre for Athletics, Recreation and Special Abilities (CARSA) building, which is scheduled for completion in the spring of 2015 on the UVic’s campus grounds (UVic n.d.). The facility will house the UVic Vikes programs, sports and recreation programs and UVic’s CanAssist program for people living with disabilities. On the southwest side of UVic campus between McKenzie Road, Gabriola Road and UVic’s artificial turf fields, CARSA has been in the works since 2009 (UVic n.d.). Careful development, along with community planning involvement, has created a very exciting opportunity for UVic to athletically shine for all of its visitors.
Situated directly across from the main entrance of the CARSA building, our medicinal tea garden will be highly visible to the facility’s visitors. This high-traffic area lends itself as an ideal place for a garden that anticipates engagement. It is our hope that the people visiting CARSA will be encouraged to enjoy what the garden has to offer.

Photographs taken from 1962 – 1997 in Turner and Lovell’s “The Changing Face of University of Victoria Campus Lands” (1999) depict the growth of the UVic campus over the years (see Appendix B). These photographs also uncover the indication that the particular site has never accommodated large use, except for the planting of four trees and the growth of non-native grass that carpets the northeast sloping hill. This site is highly regarded as “filler space” (Peter Robertson personal communication) and will be less likely to be regarded as a place of high value to people. It is our hope that because this area often goes unnoticed, we can bring positive attention towards it through our participatory native tea garden.

Four existing trees are situated on the site: two pine trees and two Pacific crabapples (Malus fusca). Non-native grass carpets the remaining area and is currently part of UVic’s landscape maintenance regime consisting of semiweekly mowing, string trimming and irrigating (Peter Robertson personal communication).

The approximate 25-degree slope of the site can be used to our advantage. The northeast-facing slope has its highest elevation in the southwest corner beside the McKinnon building and directly faces the proposed entrance to the CARSA building. The slope will allow for proper drainage of the underlying soil, ensuring the plants are never inundated with water. Another benefit of the sloped plot is that it will allow the visitors of the CARSA facility to fully view many aspects of the garden from the building’s entranceway. It is hoped that this will work much the same as advertising, sending its “customers” messages to come and check out what this site has to offer.
Cultural History

When considering restoration, it is important to look beyond ecological repair. Effective restoration should include cultural aspects as well, encouraging community engagement and participation (IUCN). This engagement helps to cultivate a sense of place and a connection to the local ecosystem (Newman-Jennings 2008). The proposed medicinal garden offers the public an opportunity to directly interact with nature. Incorporating landscape narratives into botanical gardens can enhance the educational and engaging elements (Chang et al. 2008). The cultural history of the area offers an excellent framework for this narrative. It adds a temporal dimension to the space and can provide unique avenues for participation. The land on which the University of Victoria is located has a long history of anthropogenic influence. First Nations of the area actively shaped the landscape through resource management practices. Post-contact settlement further shaped and changed the environment, eventually developing the southern tip of Vancouver Island into an urban landscape. The broad scope of anthropogenic influences extends beyond how people have physically shaped the land, it has also shaped our relationship with the land. Understanding how these views have changed over time can offer insight towards how we wish to change in the future.

The ecology of Vancouver Island has been closely linked with human activities for centuries, the extent of which has only recently begun to be recognized academically. First Nations of the region shaped the land through a variety of land management practices, which helped to improve resource production (McDadi & Hebda 2008). These management practices could be focused at a specific plant resource or at the landscape as a whole. Management strategies included transplanting, tilling, fertilization and low intensity burning with the emphasis on sustainability (Lepofsky & Lertzman 2008). While it is difficult to determine from the archeological record the full extent of these practices, by far the most dramatic and obvious was the burning regime implemented by local First Nations. The Garry Oak meadow ecosystem, which is associated with the area now occupied by Victoria arose out of frequent, low intensity burning. Seasonal burning of the savanna was employed to promote camas growth, berry production and increased output of a number of other food sources (McDadi & Hebda 2008). Apart from increasing resource accessibility, these fires kept Douglas-fir from spreading and outcompeting the Garry Oak. Without regular burning the Garry Oak meadow transitions away from a grassland ecosystem to a landscape dominated by Douglas-fir forest with sword fern understory (McDadi & Hebda 2008). However, because of First Nations' management practices the landscape appeared to be a veritable garden with bountiful resources. Without this anthropogenic influence, the ecosystem structure would be considerably different than what was experienced by early colonists.

It was the open, garden-like nature of the region that initially attracted colonists to settle the area. Early Europeans did not consider that the ecosystem was being actively managed, to them the land appeared to be naturally ready for Western-style agriculture making it an ideal location for a settlement (McDadi & Hebda 2008). Colonization, largely driven by the Hudson's Bay Company, began in 1843 and was spurred on by fears
of the island being annexed by America (Higgs 2003). However, with this rapid colonization the local First Nations were denied access to their traditional lands and many of their management practices were inhibited (Higgs 2003; McDadi & Hebda 2008). Burning still continued, charcoal levels in the soil suggests the frequency may have even increased but these were performed with the intention of clearing the land for European-style agricultural (McDadi & Hebda 2008). With settlement came the introduction of many species, both intentionally and unintentionally, which further altered the ecosystem structure (McDadi & Hebda 2008). The area remained primarily farmland until 1932 when an airfield was developed on site. At the outbreak of World War II the airfield expanded into an army base as defines against potential Pacific invasion. In the 1960s the land was purchased by the university and over the following years developed into the campus seen today (Turner & Lovell 1999). The widespread anthropogenic influence to the region is far more obvious, seeing Victoria develop from open meadows to an urban ecosystem in less than two centuries.

This drastic change in land use has effects that extend beyond the physical shaping of the landscape into how society views its relationship with the land. There has been a shift from the holistic worldview associated with indigenous cultures towards a more colonial position where humans are seen as separate from the landscape. Urban development has increased this disconnect as cities are often not considered places of nature (Price 2006). The campus of University of Victoria can offer a unique opportunity to facilitate the re-engagement of people with the environment. While the grounds promote green space within campus much of the landscape features are created with horticultural species. While beautiful, these designs lack historic context, which can add significance to these green spaces. The university has begun to incorporate native species into these spaces giving students, faculty and visitors a chance to glimpse elements that traditionally made up this landscape. We wish to extend this and provide the community with an opportunity to actively engage with nature through hands-on interactions. Direct interactions with the land can help to foster a sense of place, deepening a sense of personal means and belonging while encouraging sustainable practices (Newman-Jennings 2008). A medicinal native plant garden outside of the sports centre can clearly demonstrate the relationship between health and the environment while allowing people to actively participate in harvesting and maintenance. We hope to re-incorporate a reciprocal relationship with the land by creating a sense of place in a neglected space.
**History of Medicinal Gardens**

The historical uses of medicinal plants dates back to at least 50,000 BC as indicated by a 2012 study which found yarrow and chamomile on the teeth of Neanderthals—both of which are bitter tasting plants with no nutritional value but known medicinal properties (Hardy et al. 2012). Locally, coastal and interior indigenous tribes cultivated medicinal plants in close proximity to their winter or year round homes (Lepofsky and Lyon 2003). Commonly used species across tribes include green false hellebore, devil’s club and grand fir (Turner and Chambers 2011). As in western medicine, many herbal medicines were toxic if taken in high dosages.

In the 16th century, Italy developed the first physic gardens (medicinal gardens with a scientific basis) in in Padua (1544), Pisa (1545), Florence (1545) and Bologna (1567). These were and are grown alongside universities for the education and research purposes, providing physicians and apothecaries with live comparisons and experience identifying, preparing and purifying active ingredients in medical plants. Physic gardens later spread to other parts of Europe including the development of the Chelsea Physic Garden (1673), which didn’t open to the public, or who they called, “pleasure seekers and idlers” until 1983 (Minter 2001).

Today, medicinal gardens range from exclusively native planted plots outside of elementary schools to large research gardens, as the one present at the University of Kansas. Examples include the physic garden at the Pennsylvania Hospital (est. 1751), one at the Canadian College of Naturopathic medicine (1978) and the recently established Medicinal Garden at the Rhode Island College of Pharmacy (2013). Some of these gardens measure the presence and production of medicinal compounds by native plants under different conditions, exhibiting a science focus, whereas others, such as that outside Westwood elementary school, have more community based education goals (Rayment 2009). In addition to its long and widespread past, the herbal pharmacopoeia is constantly expanding, reaffirming a vital aspect of our necessary interdependence with the physical world.
VISIONS, GOALS AND OBJECTIVES

VISION

The purpose of this restoration is to create an interactive space, where members and visitors on campus can learn and utilize native plants medicinal plants.

GOALS

1. Create an Accessible and Inviting Green Space for People to Engage With Nature
2. Promote health and wellbeing in the greater campus community through the everyday use of medicinal plants.
3. Create an Educational Space
4. Create a low maintenance, low cost green space
5. Ensure the long-term health of the site by developing community connections and ensuring sustainable harvesting methods.

OBJECTIVES

1. To Create an Accessible and Inviting Green Space for People to Engage With Nature.

Objectives:
1. Creating a matrix of pathways throughout the garden to promote exploration and to increase the number of plants people are able to interact with.
2. Allowing as many plants to be viewed from the garden entrance as possible, so as to entice people through the garden landscape.
3. Placing eight benches along the pathways to allow for a welcoming feel and to entice people to spend more time in the garden, promoting connectivity to the natural setting.
4. Surrounding the garden with living willow fencing that is more intimate and personal than rigid fencing, while still providing the structural component to discourage grazing deer.
2. Promote health and wellbeing in the greater campus community through the everyday use of medicinal plants.

Objectives:
1. Plant medicinal plant species that can easily be used to make teas. As we want to make the plants as accessible to people as possible, we will plant species whose leaves are harvestable and have many common medicinal uses. Specific species are outlined in Appendix A.
2. Create laminated recipe cards that can be carried around the garden and used as a reference while collecting medicinal plant ingredients to target a specific needs. Plan to replace these yearly.
3. Promote the presence and use of the garden, so 70% of people surveyed in McKinnon and CARSA are aware of it, and 15% engage with the plants at least once a month.

3. Create an educational space that will allow a diverse range of visitors to engage with native medicinal plants.

Objectives:
1. Clearly mark the medicinal plants with simple, easy to read signs. Information would include a simple line drawing of the species common/latin/Lekwungen name, medicinal uses, and seasonality of harvest. Medicinal uses and seasonality would be indicated by icons (see Appendix F for icons and sign samples).
2. Constructing a small information kiosk in the center of the matrix of the pathways, that houses signs, providing detailed information on proper harvesting methods, weeding practices and stewardship practices.
3. Compiling a book of information sheets on the medicinal species in the garden. Information would include biology, ecology, medicinal preparation, traditional stories (with permission) and any significance the plant may have to other species (see Appendix E for facts sheet example).

4. Create a low maintenance, low cost green-space.

Objectives:
1. Encourage students to participate in weeding and thinning by hosting work parties at the beginning of each semester providing students with relevant knowledge.
2. Take advantage of the natural gradient of the site to minimize water use by planting species that prefer dry conditions near the top and those that thrive in moist soils at the bottom.
3. Select species that are perennial and more resilient to harvesting practices to minimize annual costs.
4. Use wood chips when creating pathways, which will lower costs and have a reduced impact on root systems when compared to pavement.

5. Ensure the long-term health of the site by developing **community connections** and ensuring sustainable harvesting methods.

Objectives:
1. Engage administrative, grounds maintenance and community stakeholders on campus to actively participate in the planning and maintenance of the garden, through an ongoing consultation.
2. Promote harvesting techniques that are not detrimental to the return of plants the next year. This includes no root or entire plant harvesting.
3. Establish an annual plan to monitor the engagement with and health of the garden, aiming for daily interaction with a minimum of five people.
ENGAGEMENT

A short list of people already consulted includes: Eric Higgs, Michelle Peterson, Nancy Turner, Neil Connelly, Peter Robertson, Tanya Taggart-Hodge and Trevor Lantz (see Appendix C for more detail). Future communication with all stakeholders is absolutely crucial for the success in implementing and maintaining this restoration project.

While we have indicated that Facilities Management, University of Victoria are to be the focus of the engagement process, there are also other stakeholder groups that should be appropriately consulted prior to implementation. These include (but are not limited to):

- Campus Planning and Sustainability
- Vikes Athletics and Recreation
- University of Victoria Student Society
- District of Saanich
- Saanich Native Plants
- Swan Lake Nature Sanctuary
- Student and faculty of the adjacent buildings

The goal of consultation is not to seek approval for the project. Rather, the objective is to engage as partners in the vision for the Medicinal Garden and work collaboratively to develop a plan for the implementation of the Medicinal Garden. Ultimately, the consultation process aims to develop a mutual, collaborative design and set of goals that suite the needs of the community, facilities management, the sustainability office and Vikes recreation.

As the aim of the project is to provide the community with experiences that encourage a sense of connection to nature and the garden, we suggest holding annual work parties at the beginning of the semester to provide a more formal, but positive setting for students to gain knowledge for the maintenance and weeding of the garden. We hope this will provide a basis for the rest of the semester for visitors of the garden to actively participate in maintenance efforts. Further engagement, including feedback through survey and a suggestion box are outlined in Monitoring Use and Reciprocity.
IMPLEMENTATION

SEQUENCE OF EVENTS

The proposed project should begin construction during the summer months, while there is a smaller student body than during the winter and spring semesters and the grounds staff will have hired additional summer staff to help with the construction. Planting should be completed during the fall to increase the chances for rainfall and allow for cooler temperatures to help establish the new plants.

DESIGN

A key element to a great garden is the design. The designing of a landscape plan of the area was important for several reasons: it provides a scaled perspective of what the finished product will look like; it allows for quick dimensioning and referencing to determine quantities and types of material, eliminating the guess work out of the construction; it shows ideal locations for specified plant material, as well as relative sizes and colors; and it ensures all companies involved in providing quotes are estimating on the same finished products and not a subjective interpretation of a hypothetical product (Young 2009).

We were looking for a design that would both capture the eye and imagination and still have a natural feel to it. We wanted our art to imitate nature. In the end, we loosely based our design on the Fibonacci spiral. The Fibonacci spiral is a logarithmic shape that correlates exact relationships between relative points of the spiral (Skinner 2006). In the natural world, this spiral is showcased through biota such as the nautilus shell, the unraveling of fern fronds, and the shape of curled horns on animals.

Due to the highly precise curves involved with the Fibonacci spiral, we foresee the layout of the design to be a complicated task. We suggest that numerous points be extrapolated from the original design plan and plotted out on the ground. Once there are enough points on the ground for the design to make sense, we suggest that rather than free handing the curves, a garden hose or piece of flexible poly irrigation pipe is used to connect the points together. This should allow for a more accurate representation of the site plan and eradicate any mistakes in the curves. We also suggest the person who lays out the design look at the finished site lay out from beyond the bottom of the hill. This will allow the person to have a full view of the design on the sloping hill. Adjustments should be made, as needed.

The pathway system is meant to connect people to the plants in a meaningful way. The natural curves of the design allow for the walker’s subconscious to feel at ease,
invoking a sense of order in the world (Young 2006). One of our goals for this project is to negate the amnesia that often accompanies the human-nature relationship. As people stroll along the path, they will further connect with nature by picking leaves to enjoy the tea that nature provided for them. It is our hope that through the site design, we can foster trust between humans and plants.

It is our expectation that the natural slope of the hill will allow us to take advantage of the good water drainage in the underlying soil. Although irrigation is still recommended, we have suggested specific locations for plants based on their water needs. For example, Yarrow is planted near the top of the hill since we know it does not like to situate its roots in wet soil (Brenzel 2007). Regardless, drip irrigation should be installed to allow for more of a reliable source of water for the growing plants. This will be especially important in the first two growing seasons, when the establishment of plants is most crucial and will require a dependable water source (Young 2009).

The site currently houses irrigation sources that functions to provide water for the carpet of non-native grass that covers the sloping hill. The presence of an irrigation system is a bonus for the site, as less work will have to be done establish irrigation. Drip irrigation should be utilized to provide less wasting of water and should be placed near the roots of established plants, ensuring proper coverage for each plant. Irrigation helps to decrease the risk of plant loss, especially during the first two growing seasons when plants are the most vulnerable (Young 2006).

Our landscape design (Appendix D) showcases one of nature’s most geometrically familiar shapes: the Fibonacci spiral. Through the use of an eye-pleasing design, a garden can entice people into it and once it does, it takes on a life of its own. It is our hope that this garden can work to re-establish the bond between humans and nature that is necessary for human spiritual growth.

SOIL CONDITIONS

Soil is the medium the plants will greatly depend on for growth. It supports plants physically and provides them with the water and nutrients they need to survive (Dearden 2009). Therefore, it is imperative that the importance of soil structure not be overlooked, as it will be indicative of healthy plant growth for many years.

Before work begins on the project, a soil test should take place. Testing should be done as outlined in the methods section. In order to allow for proper project planning, soil sampling should take place before initiating any construction efforts. Depending on the underlying soil conditions of the present site, soil may have to be amended in order for the native plant species to grow in similar soil conditions as the reference soil. Regardless of whether soil is
suitable substrate or not, small amounts of native soil should be amended into the garden beds to introduce native beneficial microbes into the environment. It is our belief that native microbes will encourage the uptake of nutrients from the surrounding soil and have a positive effect on the plants.

**BUDGET**

**MATERIALS BUDGET**

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<thead>
<tr>
<th>Material</th>
<th>Quantity</th>
<th>Price</th>
<th>Extended Price</th>
<th>Source</th>
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<tr>
<td>Mulch</td>
<td>70 cubic yards</td>
<td>$20.00 (UVic bulk pricing) /cubic yard</td>
<td>$140.00</td>
<td>Mitchell’s Farm</td>
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<tr>
<td>Garden bed signs</td>
<td>12</td>
<td>$1000.00</td>
<td>$1000.00</td>
<td>Garside Signs and Displays</td>
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<tr>
<td>Kiosk</td>
<td>1</td>
<td>$2100.00</td>
<td>$2100.00</td>
<td>Eric Shanks, Journeyman Carpenter</td>
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<tr>
<td>Nursery pots for root barrier (20 gallon or larger)</td>
<td>75</td>
<td>N/A</td>
<td>N/A</td>
<td>Local nurseries often have extras that could be donated</td>
</tr>
<tr>
<td>Benches</td>
<td>8</td>
<td>$100.00</td>
<td>$800.00</td>
<td>Home Depot</td>
</tr>
<tr>
<td>Soil amendment (compost)</td>
<td>8 cubic yards</td>
<td>$55/yard</td>
<td>$440.00</td>
<td>Mitchell’s Farm</td>
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<tr>
<td>Re-usable velcro fence ties</td>
<td>45 feet</td>
<td>$3.47</td>
<td>$3.47</td>
<td>Home Depot</td>
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**Total Minimum Cost:** $4,483.47
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<tr>
<th>Latin Name</th>
<th>Common Name</th>
<th>Size</th>
<th>Quantity</th>
<th>Price/Unit</th>
<th>Extended Price</th>
<th>Source</th>
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<tr>
<td>Rosa nootkana</td>
<td>Nootka Rose</td>
<td>5 gallon</td>
<td>8</td>
<td>$25.00</td>
<td>$200.00</td>
<td>Swan Lake October</td>
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<tr>
<td>Salix hookeriana</td>
<td>Hooker Willow</td>
<td>5 gallon</td>
<td>34</td>
<td>$15.00</td>
<td>$510.00</td>
<td>Swan Lake October</td>
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<tr>
<td>Achillea millefolium</td>
<td>Yarrow</td>
<td>10 cm</td>
<td>39</td>
<td>$3.50</td>
<td>$136.50</td>
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<tr>
<td>Asarum caudatum</td>
<td>Wild Ginger</td>
<td>10 cm</td>
<td>98</td>
<td>$4.00</td>
<td>$392.00</td>
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<td>Fragaria chiloensis</td>
<td>Wild Strawberry</td>
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<td>45</td>
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<td>Gaultheria shallon</td>
<td>Salal</td>
<td>1 gallon</td>
<td>148</td>
<td>$10.00</td>
<td>$1480.00</td>
<td>Swan Lake October</td>
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<td>Lomatium nudicaule</td>
<td>Indian Consumption</td>
<td>1 gallon</td>
<td>64</td>
<td>$5.00</td>
<td>$320.00</td>
<td>Swan Lake October</td>
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<td>Mentha arvensis</td>
<td>Field Mint</td>
<td>10 cm</td>
<td>22</td>
<td>$3.50</td>
<td>$77.00</td>
<td>Saanich Native Plants</td>
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<td>Polypodium glycyrrhiza</td>
<td>Licorice Fern</td>
<td>10 cm</td>
<td>44</td>
<td>$4.00</td>
<td>$176.00</td>
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<td>Prunella vulgaris</td>
<td>Self Heal</td>
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<td>Satureja douglasii</td>
<td>Yerba Buena</td>
<td>10 cm</td>
<td>24</td>
<td>$3.50</td>
<td>$84.00</td>
<td>Saanich Native Plants</td>
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<td>Urtica dioca</td>
<td>Stinging Nettle</td>
<td>seed</td>
<td>4 packs</td>
<td>$3.50</td>
<td>$14.00</td>
<td>Saltspring Seeds</td>
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</table>

**Total Minimum Cost =**

3,859.00

**TIMELINE**

The proposed project should begin construction during the summer months, while there is a smaller student body than during the winter and spring semesters and the grounds staff will have hired additional summer staff to help with the construction. Planting should be completed during the fall to increase the chances for rainfall and allow for cooler temperatures to help establish the new plants.
<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
<th>Minimum Hours</th>
<th>Special Comments</th>
</tr>
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<tbody>
<tr>
<td>June</td>
<td>Source Reference/Native Soil</td>
<td>4 hours</td>
<td>Native soil may be able to be removed from land development projects.</td>
</tr>
<tr>
<td>June</td>
<td>Perform Soil Test</td>
<td>1 hour</td>
<td>• To be performed minimum 2 weeks prior to soil amending.</td>
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| August 10  | Locate Underground Utilities                   | 0.5 hours     | • To be performed 3 working days before excavation.  
  • Have “Excavation Site Information” form (outlined in the “Methods” section of report) completed before calling for appointment.  
  • Ensure the location of utilities step falls one day before excavation is to take place so as not to be subject to weather disturbances. |
| August 11  | Site Layout                                    | 1.5 hours     | • Laying out of site for clear excavation  
  • Ensure site layout occurs one day before site excavation is to take place so as not to be subject to weather disturbances.                                                                                     |
| August 12  | Site excavation - leveling seating areas and pathways | 8 hours       | • Pathways to be level widthwise, but to follow grade lengthwise.  
  • Seating areas to be level (2% slope unnecessary due to the overall slope of the hill.  
  • Do not excavate through existing tree roots (adjust plans as needed). |
| August 13  | Retro-fit and install irrigation system         | 8 hours       | •                                                                                                                                                                                                                 |
| August 14  | Build up garden beds                           | 6 hours       | • Garden bed soil composition to be determined as per soil test.  
  • Garden beds to be 8 inches higher than pathways to provide definition, and angled 30 degrees upon meeting pathway.  
  • Use slinger to apply soil as it will save on labour cost. |
| August 15/16 | Install root barrier                      | 6 hours – 2 people | • As per suggestion from Peter, UVic Grounds Staff, old nursery pots collected from local nurseries can be used as root barrier.  
  • The bottoms of the pots are cut off, leaving a tube shape.  
  • Installed around the perimeter of spreading |
<table>
<thead>
<tr>
<th>Date</th>
<th>Task Description</th>
<th>Time</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 17</td>
<td>Install kiosk</td>
<td>4 hours</td>
<td>Ensure kiosk is level</td>
</tr>
<tr>
<td>August 17</td>
<td>Install benches</td>
<td>2 hours</td>
<td>Ensure benches are level</td>
</tr>
</tbody>
</table>
| August 17 | Apply mulch                                           | 1.5 hours| Apply 2 inch layer of mulch to discourage weed growth over the next couple of months.  
|           |                                                       |        | Rough application, doesn’t have to be perfect.                       |
|           |                                                       |        | Use slinger for mulch application as it will save on labour cost.    |
| September 1| Source plants                                         | 1 hour | Source plants 4 weeks in advance to ensure availability.             |
| October 15| Pick up plants and unload                             | 4 hours| Water plants before leaving nursery                                   |
|           |                                                       |        | Cover with a tarp during transport to avoid wind damage.             |
| October 16/17/18 | Plant Garden Beds                                    | 16 hours – 2 people | Planting as per landscape plan.                                      |
|           |                                                       |        | October planting would be the best time due to the higher precipitation. |
|           |                                                       |        | If plants are in dormant stage, use a placement flag or stake for locating when mulching. |
|           |                                                       |        | Hand water plants to allow for good root establishment.              |
| October 18/19 | Plant willow fencing                                | 8 hours – 2 people | Planted as outlined in “Methods” section of report.                   |
|           |                                                       |        | Hand water plants to allow for good root establishment.              |
| October 20 | Apply mulch                                           | 4 hours – 2 people| Four-inch even layer of mulch.                                      |
|           |                                                       |        | Ensure placement does not build up around plant stems.              |
|           |                                                       |        | Leave crowns of plants uncovered.                                    |
|           |                                                       |        | Use slinger for mulch application, as it will save on labour cost.  |
| October 20 | Install signs                                         | 1.5 hour| Plant signs to be placed in front of applicable plant, ensuring visibility from pathway. |
| October 21 | Prepare for grass seed along outside perimeter of willow fencing | 2 hours| Ensure adequate soil base                                            |
|           |                                                       |        | Level soil using landscape rake                                      |
|           |                                                       |        | Seed with UVic grass seed                                            |

**Total Minimum Billable Hours: 79 hours**
MONITORING AND EVALUATION

Monitoring must occur throughout the onset and lifetime of the restoration, so that the garden may continue to act as a source of wellbeing for the campus community. During monitoring, the landscape may be re-shaped to better address the goals put forward. The act of monitoring itself will increase awareness of effectively engage people in a reciprocal relationship with nature, promoting a sustained care for the garden and a healing relationship for both parties.

MONITORING PLANT DYNAMICS

On an annual basis, surveys will be conducted to evaluate the health of existing species and community interactions. This includes noting possible negative or positive effects that individuals are having and either controlling or removing plants who are negatively affecting their neighbours. Certain factors should be closely monitored at the beginning of the garden’s life, namingly browsing by herbivores such as deer. If the willow fencing is ineffective it should be adjusted or replaced if need be. The effect of abiotic factors including soil minerals, shade and moisture should also be reviewed on an individual plant basis, and followed up by fertilization or translocation.

Ideally all species in the initial plan and garden should be kept. If this is not possible, due to mold, herbivory, or lack of niche space, medicinal plants may be replaced with other medicinal species.

MONITORING USE AND RECIPROCITY

It is largely understood that the formal evaluation and gardening of the place will be undertaken by the University of Victoria Facilities Management, but one of the main objectives of the project is an ongoing campus community interaction with the landscape beyond simply taking for personal healing. Ideally, monitoring and reciprocity will take place at a user level, as those individuals who use the medicinal plants with give thanks to them by eliminating weedy competition. This restoration through reciprocity will be directly promoted through the sustainability principles outlined in the objectives for goal three.

Engagement with the garden by the campus community will be monitored by giving questionnaires to a random sample of public/students/faculty in CARSA and McKinnon (see Appendix G for template). The project aims for an engagement of at least 5 people/day and an awareness of at least 80%, with 15% of people in the adjacent buildings engaging with the medicinal plants at least once a month. Engagement includes physically using the plants in medicinal tea, but also the act of simply situating oneself in the garden for a sustained period of time, since nature itself is a healing agent. Results
from the questionnaire will be used to understand encouraging factors or barriers in the use and care of the garden. Particularly it will help understand:

- Whether the garden positively affected the health and wellness goals of the CARSA development
- Why the public are choosing (or not choosing) to use the medicinal plants
- Barriers to weeding and care of the garden
- The main demographic visiting the CARSA garden (different majors, backgrounds, genders, etc.)

An ongoing suggestion box placed at the Kiosk is suggested as well, to address concerns of garden visitors and adjust the garden, or the information displayed accordingly. The goal of the garden is interaction, therefore, it’s crucial that the space be culturally friendly and adaptable to attract visitors.

In summary, this project aims to monitor and maintain a working medicinal garden through reciprocity as exemplified by traditional people, farmers and gardeners worldwide, where particular plants are cared for, in thanks for the care they provide to us.

**CONCLUSION**

Our project aims to engage people in hands-on interaction with plants, by creating a relationship of reciprocity and well-being through a medicinal tea garden. A place of realized interdependence with nature on campus would foster a greater connection of the land and stewardship nature. The main goal of the project is engagement and an ongoing, changing cultural landscape, in which the users maintain the beds and take care of the plants. We request native plants, for two reasons: (1) to educate people about the traditional culture and history of the place UVic is situated on, (2) to allow people to use the medicinal plants as they find them naturally occurring elsewhere, in forests or meadows on the Island. Justification for the suggested location of the garden, in between CARSA and McKinnon, falls under the following reasoning: (1) the garden needs to be placed in a high traffic zone, in order to comply with the “everyday” use goals, (2) both McKinnon and CARSA are facilities which aim to promote and maintain the health and well-being of the campus community. Given the demonstrated healing power of plants and nature itself, a medicinal garden could compliment the goals and image of both facilities.
REFERENCES


Capital Regional District. Gardening with Native Plants. Habitat Acquisition Trust. Victoria, BC. Accessed November 5 from:


Hardy, Karen; Lalueza-Fox, Carles; Huguet, Rosa; Bastir, Markus; Santamaría, David; Madella, Marco; Wilson, Julie; Cortés, Ángel Fernández; Rosas, Antonio; Buckley, Stephen; Collins, Matthew J Estalrrich, Almudena; Brothwell, Don; Copeland, Les; García-Tabernero, Antonio; García-Vargas, Samuel; de la Rasilla, Marco (2012.) Neanderthal medics? Evidence for food, cooking, and medicinal plants entrapped in dental calculus. Naturwissenschaften. Springer-Verlag doi:10.1007/s00114-012-0942-0


## APPENDICES

### APPENDIX A: POTENTIAL SPECIES PROFILES

<table>
<thead>
<tr>
<th>Nomenclature</th>
<th>Medicinal uses</th>
<th>Moisture Regime</th>
<th>Sunlight Regime</th>
</tr>
</thead>
<tbody>
<tr>
<td>False Solomon’s Seal</td>
<td>Used to treat sore throat, cold, upset stomach, to regulate menstration and birth control. Can also be used in a poultice for cuts.</td>
<td>M</td>
<td>Sh, PS</td>
</tr>
<tr>
<td><em>Smilacina racemosa</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stinging Nettle* <em>Urtica dioica</em></td>
<td>Can help with sore joints/muscles, lowering blood sugar, bladder infections, and kidney inflammation. A spring tonic can be made from stinging nettle that cleanses the kidney and bladder and is good for strengthening hair, nails and skin.</td>
<td>M</td>
<td>S, Ps</td>
</tr>
<tr>
<td>Yarrow <em>Achillea millefolium</em></td>
<td>Can be used to treat colds, coughs and sore throats as well as upset stomachs. Can also be used as a poultice to treat headaches. It contains aspirin-like derivatives which produce an anti-inflammatory effect</td>
<td>D</td>
<td>S, PS</td>
</tr>
<tr>
<td>Licorice fern <em>Polypodium glycerrhiza</em></td>
<td>Used to treat colds and sore throats. Also acts as a natural sweetener.</td>
<td>M</td>
<td>PS, Sh</td>
</tr>
<tr>
<td>Indian consumption plant <em>Lomatium nudicaule</em></td>
<td>Stems are rich in vitamin C and can be used to flavour teas. The seeds can be used to relieve colds and sore throats.</td>
<td>D</td>
<td>S</td>
</tr>
<tr>
<td>Wild ginger** <em>Asarum caudatum</em></td>
<td>Used as tea to help with stomach pain, headaches and as a tonic for colds and fevers</td>
<td>M</td>
<td>Sh</td>
</tr>
<tr>
<td>Wild Strawberry** <em>Fragaria chiloensis</em></td>
<td>Leaves can be used in tea that can help to treat diarrhea. Chewed leaves can also be applied to burns as a poultice.</td>
<td>D, WD</td>
<td>S, PS</td>
</tr>
<tr>
<td>Self Heal <em>Prunella vulgaris</em></td>
<td>Astringent. Used in tea for sore throat and ulcerated mouth. Leaves applied externally for cuts.</td>
<td>M</td>
<td>S, PS</td>
</tr>
<tr>
<td>Field mint <em>Mentha arvensis</em></td>
<td>Leaves can be used in tea to treat colds, sore throat, fevers, cough, gas, colic, stomach pain, heartburn, headaches and nausea. Poultice for</td>
<td>M, WD</td>
<td>S, PS</td>
</tr>
<tr>
<td>Plant Name</td>
<td>Uses</td>
<td>Recommended Uses</td>
<td>Growth Pattern</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------</td>
<td>----------------</td>
</tr>
<tr>
<td><strong>Yerba Buena</strong> <em>Satureja douglasii</em></td>
<td>Used in tea with Indian Consumption Plant to treat for colds.</td>
<td>WD</td>
<td>S, PS</td>
</tr>
<tr>
<td><strong>Nootka rose</strong> <em>Rosa nutkana</em></td>
<td>Rose hips can be used in tea as a source of Vitamins A, C, E. It should be noted that there is a layer of hairs around the seeds just beneath the flesh of the fruit. These hairs can cause irritation to the mouth and digestive tract if ingested, it’s recommended they are removed before using the hips.</td>
<td>M, WD</td>
<td>S, PS</td>
</tr>
<tr>
<td><strong>Hooker Willow</strong> <em>Salix hookeriana</em></td>
<td>Leaves and bark contain salicylic acid, a precursor to Asprin.</td>
<td>M</td>
<td>S</td>
</tr>
</tbody>
</table>

* = spreader  ** = ground cover

Sources: A field guide to Western Medicinal Plants and Herbs by Foster and Hobbs; Plant of Northern British Columbia by Mackinnon and Pojar; Gardening with Native Plants by the Capital Regional District


Centre for Athletics, Recreation and Special Abilities design. Source: University of Victoria CARSA Project website. Edited to highlight the garden location.
APPENDIX C: CONSULTATION - VALUED INSIGHT

Eric Higgs
Environmental Studies Professor
(250) 471-5070
ehiggs@uvic.ca
Eric was the teacher for Ecological Restoration (ES 341/ER 311) and a source for much of the restoration planning and guidelines implemented in this proposal.

Michelle Peterson
Manager, Operations and Infrastructure
Vikes Athletics and Recreation
250-721-8412
mpeterso@uvic.ca
Michelle provided us with the blueprint for the CARSA plan and pointed us to more people we should consult with.

Nancy Turner
Ethnobotany Professor and Author
250-721-6124
nturner@uvic.ca
Nancy informed us of potential native medicinal plants and cultural history of Physic gardens. She recommended ensuring that the garden was properly watered and maintained, to prevent spreading species from taking over, or other plants from drying out.

Neil Connelly
Director
Campus Planning and Sustainability
(250) 472-5433
nconn@uvic.ca
(Contacted Oct 17)

Neil informed us of the landscaping plans for CARSA and possible locations for a herbal garden. There were 3 possibilities: the corner we chose, the opposite northern corner which was to be vegetated and used as a storm water buffer to Bowker Creek and the large middle area allotted to the future aquatics development. Connelly said that the future aquatics area would remain fallow as a grass or gravel field until the funding was secured, in what he estimated to be 10 years. Furthermore, Neil informed us that the corner beside McKinnon gym, at which we were looking to install a garden, might have a stone wall being built in, depending on how much it cuts into the hill.
Peter Robertson  
Groundskeeper  
Facilities Management University of Victoria  
250-213-2959  
Peter is referenced extensively in our paper. He provided us with details on the site location, current management procedures of the university and projected changes upon the implementation of a native plant garden. Furthermore, he provided suggestions for plants and insight on sources and pricing for materials used in the budget, including the mulch and soil.

Tanya Taggart-Hodge  
Environmental Studies Teaching Assistant  
taggarth@uvic.ca

Trevor Lantz  
Professor and Landscape Ecologist  
University of Victoria  
tlantz@uvic.ca  
250-853-3566  
Trevor informed us of nearby botanical gardens that we may use a reference ecosystems, including the UBC Botanical garden.

SUGGESTED CONTACTS:

David Perry  
Director of Capital Development  
Facilities Management University of Victoria  
djperry@uvic.ca  
SAU 115  
250-472-5645

Rhonda Rose  
Supervisor of Landscape Horticulture  
Facilities Management University of Victoria  
rrose@uvic.ca  
250-721-8765
See paper copy handed in or contact Lynn Rannankari for greater resolution.
APPENDIX E: FACT SHEET SAMPLE

Below is a sample of the type of information that could be presented on the species fact sheet. The finished product would also include pictures and/or line drawings of the plant and its medicinal components.

**Common Name:** Stinging Nettles  
**Scientific Name:** *Urtica dioica*  
**Coast Salish Name:** T’thuxt’thux

**General description:** Nettles are a dark green, leafy perennial with stems that can reach a height of 1-3m. The plant has oval shaped leaves with saw-toothed edges. The flowers are pale green, drooping clusters hanging down from where the leaf meets the stem.

**Habitat and Distribution:** Various subspecies of stinging nettles can be found across the globe. Within North America, nettles can be found coast-to-coast, north up into the Territories and Alaska and as far south as Northern Mexico. While nettles can tolerate a range of climatic conditions, the plants generally prefer to grow in shaded, damp environments. There is a high likelihood of finding a patch along rivers and stream. Nettles are often found in disturbed habitats, allowing them to do well in the green spaces within cities.

**Medicinal Uses:** The leaves of stinging nettles can be used in tea. Nettles are not only high in vitamins A, D and E but are also a good source of calcium and potassium. A spring tonic can be made from stinging nettle that cleanses the kidney and bladder and is good for strengthening hair, nails and skin. It can help with sore joints/muscles, lowering blood sugar, bladder infections, and kidney inflammation.

**Harvesting:** When foraging for nettles use scissors, a small knife or your fingers to collect the leaves. Only harvest a few leaves at a time to prevent damaging the plant. The most important thing to keep in mind while harvesting nettles is to protect bare skin. While nettles can spread rather prolifically and are considered a weed by some it is still important to harvest responsibly. Do not harvest an entire patch; be sure to leave some new growth for the plants and other foragers.

**Caution!** True to their name, nettles cause an irritating sting when they come in contact with bare skin. The hollow hairs that cover the plant break easily when touched, releasing formic acid. This causes a burning or stinging sensation, often accompanied by a rash. This can last for a few minutes to a few hours, depending on your sensitivity. It is important to remember to bring a pair of gloves when harvesting nettles. Long plants and closed-toed shoes are also recommended.
Other Use: Nettles can be enjoyed in a variety of ways; however, they should not be eaten raw. Blanching, steaming or drying the nettles neutralizes the sting. The steamed greens are delicious by themselves but they can also be used in place of cooked spinach in many dishes. Traditionally, the stems of nettles were an excellent source of fibre for many First Nations communities. Nettle fibre was used to make fishnets and snares, among other uses. Stems were cut down in late summer and early fall, before the rains begin and the fibres decompose. The stems must then be allowed to dry before the fibres can be peeled away from the woody interior.

References – (section at end of every individual fact sheet)


APPENDIX F: ICONS AND PLANT SIGN SAMPLES

The following icons would be placed on the small plant signs, allowing for ease of use by garden visitors looking for tea ingredients.

Icons indicating Season of Harvest

Year- round Harvest  
Summer and Fall Harvest

Icons indicating Medicinal Use

SWEETNER  
DIARRHEA  
NAUSEA  
COLD  
SORE THROAT  
PAIN  
SINUS
Ideally, we would want icons for nausea, muscle pain, sore throat, bladder infection, taste (sweetner), diarrhea, colds, fever, and as a poultice. The above are examples of a few of these.

Sample of a plant label:

Indian Consumption Plant
*Lomatium nudicaule*

Sa /q'axmin/

- Sore Throat
- Sweetner
- Cold
APPENDIX G: SAMPLE SURVEY

To be given to a random group of people in McKinnon and CARSA in order to monitor engagement with Medicinal Garden.

1. Are you:
   a student     faculty member     alumni     community athletics     other

2. If you’re a student, what faculty are you in?
   _______________________________________________________

3. Are you aware of the existence of the medicinal plant garden in between McKinnon and CARSA?  Y  N

4. Please indicate if and how often you use the garden, whether this means sitting in it or actually using the plants in tea.
   several times a week   several times a month   once a month
   seldom   never

5. If you do use the garden, how do you feel about the space and plants?  n/a
   ___________________________________________________________________________
   ___________________________________________________________________________
   ___________________________________________________________________________

6. If you don’t regularly use the garden, what are barriers for you in visiting the garden?
   out of my way   not interested   don’t like tea   n/a
   other_________________________