

The Finnerty Dynamic Garden:
*Restoring Engagement to an Ignored Green Space
at the University of Victoria*



ES 341
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INTRODUCTION

Site Description and History

The Finnerty Native Plant (FNP) Garden can be found to the left of the MacLaurin building when facing away from the Centre Quadrangle at the University of Victoria. Today it lies surrounded by a trimmed grass lawn and sidles a busy parking lot on its west edge. The Garden's circular pathway is accessible from three entryways: two of which are located south of the area and are indicated by trellises. Around the circular pathway a barrier of trees insulated the Garden from sound – within it a small marshy pond adds to the sense of stillness. Most university passers-by use the north path as a shortcut between Ring Road and inner campus. The only bench in the garden can be found on the north path, streaked with mildew and lichen, while the less expedient side of the path is overgrown with moss and grass. Proximity to the Cedar Hill neighbourhood allows somewhat more conscientious human users to enjoy the small site, but all walk quickly through. It remains an unkempt island of native plants amidst the urban landscape.

Long before UVic's construction and prior to white settlement, the university area was a patchwork of swampland and underbrush; these two habitats can be represented by the center marsh and exterior barrier of trees, respectively. The territory plays a large role in the oral mythology of the Saanich and Songhees First Nations, and was used for medicinal and ceremonial purposes. Some harvested plants included the waxberry (*Symphoricarposalbus*), Indian plum (*Oemleriacerasiformis*) and crab apple trees (*Malusfusca* or *Pyrusfusca*); the buds of black cottonwoods (*Populusbalsamifera*) as well as the bark of western hemlocks (*Tsugaheterophylla*). Uses varied from foodstuff to ceremonial, dugout canoes to woven baskets. Many of these traditionally used species are now admired for aesthetic appeal only.

In 1974, what we now call the FNP Garden was carved out of the lawns to host the original Finnerty Gardens. It was designed to be purely ornamental – host to a donated patch of rhododendrons. That collection of plants was moved to its current location as of 1988, to the other side of Ring Road, beside the Interfaith Chapel near the Fine Arts building. Only in 1993 did a local public interest group and that year's graduating class combine efforts to redesign the

original site as a native plant display. Their intention was for the garden to be useful to future students of ecology, biology, native and/or environmental studies. Since then there has been no utilization or expansion, and the FNP Garden's basic ecological integrity is maintained "with the bare minimum of effort" by facilities management.

Problem Identification

Despite the site's proximity to Ring Road, its visibility is limited by an enclosure of trees and underbrush that hides the interior. The site suffers from constant ivy, bamboo, holly, reed and hedge invasions, over-evaporation and poor drainage of the central pond, its signage being limited, its pathways being in disrepair, and of course plant overconsumption by the university's rabbit population. However, the problem can be summarized: *a lack of interest in the site.*

Facilities management puts as little energy into the FNP Garden's as it does because they, representing UVic as the site's shareholder, know how little most people care about it. Many students likely are not aware of its existence or intent. The problem of poor cultural investment in FNP Garden is also propelled by its lack of ecological resilience: the area is on the books for possible future building sites, and it will be especially vulnerable to destruction if still underused by the community and over-dependent on maintenance.

Ironically, the 1993 decision to create the site as an outdoor classroom for students was made from the top-down, and now its fate must be reversed from the bottom-up, by students who will have to restore resilience in order to draw investment.

Goal

At this stage in the project we seek to both carry forward and reframe our preceding group's goal in restoring the FNP Garden. We consider their vision for this project to have been too narrowly focused. It paid close attention to restoring the area's integrity as native plant display through the eradication of invasives and a replacement of local plant species, but ignored the intrinsic problems associated with the concept of display gardens. Their costly maintenance must always prevent change, and interest is only held at an aesthetic level. These problems with the display garden are largely why the Finnerty site initially fell to the wayside.

Our goal remains to restore the integrity of a native plant assemblage in the short-term, but we have expanded the project goal in the long-term: to create a ‘*dynamic garden*’ that will ensure that both ecological resilience and cultural investment in the site can be preserved. Autonomy and investment are the means, rather than the ends, to a successful restoration of dynamism in FNP Garden. As the project phases progress, this dynamic character will go beyond mere species display into new capacities. It will represent native habitats, serve as a community gathering point, and enable experiential learning in an outdoor classroom setting. We realize that the creation of a dynamic garden must work with the inherent constraints of a small, fragmented and severely impacted system, but we also acknowledge even the smallest site’s potential to be a useful and significant space.

Ecologically, a dynamic garden will contain native plant assemblies which resemble their reference habitats (swampland, underbrush) to the greatest degree possible. That is, plants will not be separated into individually labelled plots to be appreciated in and of themselves (as proposed by the 2008 report). Native species will instead be interplanted and allowed to grow together as they would naturally. Traditional resource harvest in such a site is encouraged, and such useful plants should be cultivated. A dynamic garden in an urban landscape like that of UVic can never become completely self-maintaining or perfectly integrated into a larger ecological matrix, but it will function as naturally as possible. Human intervention is needed to build resilience to invasions and other stress events, just like in any display garden – a dynamic garden’s potential for autonomy will emerge as ecological resilience is built alongside cultural investment.

The project’s goal for dynamism will be outlined through its objectives, and realized through implementation of the action plan. However, it will be helpful to outline the aforementioned constraints of the site, which inform how our objectives interpret the goal.

Constraints

Ecological Constraints

The garden exists within an area that encounters high levels of daily disturbance. Human activity and rabbit grazing are endemic to all of campus and must be worked within. As a small

fragment of productive land amidst unproductive lawn, road and buildings, the Garden's soil, nutrient and hydrological cycles will always be impaired by pollution, run-off erosion and edge effect disturbance. All of these factors demonstrate that this site will need ongoing care and maintenance to continue it on a trajectory to a healthy native plant garden. Autonomy is inherent to a dynamic garden, but it must be a manicured autonomy; high levels of maintenance will only be necessary at the project's outset.

Cultural Constraints

Because of its location, any restoration work must proceed in accordance with UVic as well as municipal policies. Given the value of the land within Ring Road, and the location being slotted as a building site, it is apparent that any decisions on the direction of FNP Garden will have to proceed through consultation with stakeholders both on and off campus. A garden, unlike an ecosystem, exists at the whims of human need: if a building in that site is deemed more useful and sustainable than the FNP Garden not much argument that can be made. Time, funding, and dedication will determine the success or failure of this project, as with any restoration initiative. However, because this was made and is maintained for human usage, restoring it as an ecosystem would be impossible and irresponsible to those who do enjoy it – restoring the site's dynamism through cultural investment and utilization is the only way to protect the area.

Objectives

Working within said constraints, the objectives that will be met in order to reach this project's goals can also be divided into the ecological and cultural. The 1 to 5 numbering of each can be thought to proceed from short-term to long-term objectives, to be undertaken by future groups continuing the project.

Ecological Objectives

1. A removal of invasive non-native plant species in tandem with a replanting of native plants suitable to the site's current condition of invasion and fragmentation.

2. Emphasis on the planting of edible and traditionally useful species.
3. Fencing the area to keep rabbits and deer out, (similar to the GOMER Project perimeter).
4. An assessment of hydrological conditions and nutrient levels, in order for future deliberation to be made on possible structural adjustments to the marsh's drainage.
5. Long-term planning for which areas of the Garden will best represent local habitat assemblages, with an expansion over the unused surrounding lawn if feasible.

Cultural Restoration Objectives

1. A semesterly organization of volunteer groups (through ES 341 and/or 240) that will continue to engage in restoration tasks over each phase, keeping the site in discussion.
2. Ongoing outreach to community users for education and input on the restoration.
3. A redesign and expansion of signage, bench areas, and (if feasible) the construction of an additional long trellis at the highly visible north entrance that will attract passers-by.
4. Community events showcasing the traditional usefulness of species used by First Nations in the area (such as the camas bulb pit roast of 2006), that will further the UVic's pledge to honour its Coast Salish heritage.
5. To propose a location in the site to serve as an experiential outdoor classroom, possibly in the form of a covered platform/gazebo.

In order to link our objectives with their implementation in the action plan, these two categories of ecological and cultural can be reinterpreted in the phases of *maintenance*, *awareness* and *education*.

Phase	Objectives
<i>Maintenance</i>	<ul style="list-style-type: none"> - The removal of exotic invaders and replanting of useful natives. - Fencing new plantings, as well as existing native species. - Future restoration project for the pond's hydrological integrity, and a division in to representative habitat areas.
<i>Awareness</i>	<ul style="list-style-type: none"> - Advertising the restoration project to UVic's students, faculty and surrounding neighborhood. - The creation of new and more attractive signage, and possibly a new trellis at the most visible north entrance. - Holding local events to bring together stakeholders around the site's potential in Coastal Salish recognition and its traditionally useful plants.
<i>Education</i>	<ul style="list-style-type: none"> - Connect students with the FNP Garden through the ES curriculum, encouraging faculty to regularly involve it. - Design and build a covered area suitable for outdoor classroom usage through interdisciplinary consultation (with engineering and visual arts for example.)

Figure 1: Table of Objectives by Phase

ACTION PLAN

Phases

This section will provide a detailed action plan describing how the aforementioned objectives are intended to be accomplished by phase. These phases are not by any means meant to be interpreted as strict: instead, they should guide the future groups involved in the restoration of FNP Garden who agree with the goal and objectives of this report. For instance, our group has engaged in the first invasive pull of the maintenance phase as outlined by the previous report, because it fit into our goal for a dynamic garden. We also understand that this timeline may become unrealistic or less ideal than originally thought as the project continues. Adaptation of each phase to new trends in and around the site is encouraged; after all, that is what a dynamic garden seeks to do.

Each phase suggests an optimal season for their associated actions, and a relative cost assessment which may be alleviated by recruiting project teams from inside a curriculum. Each also describes the actions of a phase by their organization and implementation.

Phase One – Maintenance

COSTS: Moderate to low, for seedlings and advertising material.

DURATION: 2 – 4 weeks per action, each semester, as needed.

Action 1, The Pull

ORGANIZATION:

- Consider advertising the action's support of native plants, rather than its destruction of invasives. This may garner more interest. (*Note: an example poster used to advertise our "ivy pull" can be seen in the appendix. The event did not attract any support.)

- Post notices around campus and in local community centers; request that UVic's campus radio station, CVUF 101.9fm, announcement the action one week prior.
- Speak at ES 200, 240 and 341 lectures, and pass around sign-up sheets for email addresses in order to create a mailing list.
- Secure tools and gloves from restoration professor in the School of Environmental Studies. Communication with facilities management is also encouraged.
- Turn what could be considered a chore into a way that people actually want to spend their time – provide food, warm drinks, and music. Have fun.

IMPLEMENTATION:

- Use work parties of about eight to ten people, depending on success of recruitment efforts. (Our group operated in a party of six and cleared a substantial area in only two hours, but could not eliminate any invasive species altogether in a single day.)
- Concentrate on English Ivy (*Hedera helix*), with secondary efforts focused on Black Bamboo (*P. Vivax*) and English Holly (*Ilex aquifolium*).
- Ensure that all plant matter, once removed, is picked up by facilities management.
- If native replantings do not occur immediately after a pull, use leaf mulch to cover disturbed sites until planting.
- Leave some sort of notice on site, explaining the removal of vegetation to any community users who pass through.

Action 2, The Plant

ORGANIZATION:

- It is very important that the planting promptly follows the pull, so that exposed soil does not remain open to colonization by new, likely unfavourable invaders. This plan recommends no more than one month be allowed to pass between actions 1 and 2.
- Less labour is required here than with the pull, but it is recommended that the organizers attempt to ensure the return of those workers who assisted with the pull.
- Before and after photography should be planned, and success be made visible.
- An incomplete collection of plant prices from local retailers can be found in the appendix.

IMPLEMENTATION:

- This plan suggests that the groundcover of the Western Sword Fern (*Polystichum munitum*) and Salal (*Gaultheria shallon*) make them optimal replacements for English Ivy and Holly (*Ilex aquifolium*); the water absorption of Swamp Lanterns (*Lysichiton americanus*) and Snow Berries (*Symphoricarpos*) make them optimal replacements for Bamboo (*P. Vivax*) and Reed Canary Grass (*Phalaris arundinacea*) removed near the pond.
 - Establish watering regimes with facilities management. This is very important, because most plantings will require significant watering to fully establish.
 - Tend to seedlings over next year (through fencing or a further pull of invasives).
-

Phase 2 – Awareness

COSTS: High, for the design of signage and construction of trellis.

DURATION: 1 – 2 years for design and construction, ongoing for local events.

Action 3, Signage & Trellis

ORGANIZATION:

- Contact Office of Campus Planning and Sustainability to ensure uniformity with other signage on campus; a correspondence with the visual arts faculty is suggested.
- Rather than using display-garden type signage (where many small, descriptive and specific signs are placed at the foot of certain trees and shrubs), at least one larger sign should be designed that explains the concept of a dynamic garden.
- Visuals should be as prevalent as text. Signs with short descriptions for each useful native plant present in the garden should increase knowledge about Coast Salish traditions.
- Budget and design the idea for new benches and a new trellis at the north entrance

IMPLEMENTATION:

- Temporary signage should be placed at all three entrances that outlines the restoration; make sure that this does not impede the activities of facilities management.
- Proposals and consultations should be made with UVic for an expansion of the site and new construction once interest is established.

Action 4, Community Involvement

ORGANIZATION:

- If nearby Cedar Hill residents' needs are assessed, if they can be approached to use the site, then defense against its destruction and support for its expansion will grow. Local yoga groups, gardeners of native edibles, social interest groups and other hobbyists need to be contacted openly.
- The UVic Childcare Center has expressed interest in holding outdoor daycare and activity days in ecologically healthy spaces, and the Ian Stewart Facility's summer youth recreational programs could be oriented towards the site.

IMPLEMENTATION:

- An effective way to create a base of people in support of the project is to simply plan events there. The possibilities for how UVic clubs might use the FNP Garden are as great as people's will to have fun are – but free cookies and tea at any such event are sure to attract interest.

Phase 3 – Education

COSTS: None for class usage, Low for continuing experiential usage.

DURATION: Indefinite

Action 5, An Outdoor Classroom

ORGANIZATION:

- Divide the site into areas of habitat representation based on plant assemblage.
- Divide the site into five quadrants, and prioritize them for a further maintenance and monitoring phase based on the success of prior restoration.
- Produce a short report to submit to professor(s) whose curriculum could incorporate maintenance on priority plots. Because the experiential needs of different classes may change, emphasize that a dynamic garden is its own laboratory: techniques that fall outside of this report's suggestions are welcomed so long as they are accompanied by monitoring and repair if needed.
- Locate an area in or adjacent to the garden where a rain cover and/or platform could be constructed, and submit a plan to both faculty and administration. The use of material from the site itself would be optimal; the chance of a small platform to serve as a First Nations art exhibit (through carving or mural) should be included.

IMPLEMENTATION:

- Contact the directors of the Schools of Environmental and Native Studies, Biology, Visual Art and Engineering, etc., with a preliminary call for suggestions. Interdisciplinary co-operation and the dynamic garden's potential to accommodate human use alongside resilient ecology should be emphasized.
- Continue the project in future ES 341 and 240 classes. Any ES course that deals with urban restoration or gardening should consider using the site.

Future Phases

In order to maintain a realistic scope, this action plan has ignored some important aspects of dynamic garden creation and a full restoration of ecological resilience and cultural investment. Once the issues already in the action plan have been addressed, other important avenues will still

need to be pursued. To generate future projects and for the sake of completeness, this section points to a few of these concerns.

Health of the Pond

The pond is replenished by an underground irrigation system, and is prone to a high evaporation rate. It will likely always need to be sustained by irrigation, as there is no natural source of water, but the marshy pond continues to house mating mallard ducks and the native cattail (*Typhalatifolia*). The reintroduction of native painted turtles (*Chrysemys picta bellii*) may also become appropriate in water filtration and nutrient levels can be improved. A first step in this direction might include establishing a maintenance regime on the pond with facilities management and the School of Environmental Studies. This maintenance would include dredging and skimming duck-weed to allow for new growth, and the removal of organic solids to promote higher oxygen levels (by preventing decomposition of these materials in the water). The most important restoration technique for the ponds is the dredging of leaf-fall. Decomposing leaves are high in tannins and may increase the acidity of the pond. Dredging could be accomplished with water-wader pants, rakes and of course more labour. Any activity that promotes the growth of rushes in the pond should be encouraged, as they have a cleansing effect on pond hydrology.

Non-Native Tree Removal

Any form of arboriculture has been excluded from the action plan. This is not to say that a valuable future project might not include the removal of the FNP Garden's numerous non-native ornamental trees and the return of native trees through planting. The budget associated with such an activity would be fairly high, as would the chance of conflict with current users who enjoy the trees, but the aesthetic and ecological pay-off would be sellable to stakeholders. If felled ornamental trees are used somehow in any construction of benches or signage on site then all the better.

Covered Platform

To provide a shelter for students conducting lab work, increase campus and neighbourhood enjoyment of the site, and to discourage future building construction on the site, the writers of this report suggest considering a rain-cover of some type. This project would bear considerable costs and planning outside the range of an ecological restoration class, so it is not included in this action plan. If use of the site does increase, however, the providing of rain-cover could be a valuable and rewarding project. An issue to consider is noise pollution from Ring Road, but there are appropriate spots in and adjacent to the garden where this would be less of a problem.

Monitoring

Though the FNP Garden Restoration Project has not proceeded beyond a preliminary round of maintenance, proper monitoring procedures are essential to the completion of any successful restoration. Measures should be established to analyze the progression of physical, biological and chemical characteristics in the restoration site, appropriate to the goals and objectives of the project's design⁷. The monitoring module for the restoration of the Native Plant Garden will therefore focus on ensuring that the progression of the site is proceeding in the intended trajectory⁷, as a semi-autonomous dynamic garden, whilst satisfying the objectives of maintenance, awareness and education. Results from data collection during the monitoring phase of the action plan will be used to "inform subsequent management efforts" as proposed by the previous report, "Native Plant Display Garden").

Strategies for monitoring the site are also divided into the three objective subsections of maintenance, awareness and education. These will assess the representation of native habitats, the level of community interaction within the site, and the degree to which experiential learning is occurring within the outdoor classroom. With respect to maintenance, focus will be on the identification and abundance of invasive non-native plant species, native plant species survivorship after planting, and native plant species abundance (in relation to hydrological regimes and nutrient levels in the soil). Pertaining to awareness, the development of appropriate signage will be focused on. Lastly, in relation to education, focus will be on the site's usage by UVic and the progress of its division into plots for classroom usage.

Monitoring will be conducted on semesterly intervals so that any unanticipated variables encountered may be responded to promptly and will not negate the efforts of the ongoing restoration (as proposed by the 2008 report, “Native Plant Display Garden”). The success of ecological restoration in the FNP Garden and the re-envisioning of it as a dynamic garden will demand a modest but continuous investment of time and financing by UVic students, faculty and administration, and should also include members of the surrounding Cedar Hill community.

Maintenance

1. Visual Analysis:

As suggested in the previous report, ecological monitoring will enlist the use of quadrants measuring six-by-six meters. Five separate locations should be monitored; each selected to represent differences emerging within hydrology, soil composition and abundance of invasive plants. The varying conditions within the different locations of quadrants will help provide for a more holistic view of the health and functioning of the dynamic garden. (*Note: two of the five quadrants are not visible on the site map in the appendix, due to space limitations.)

Quadrants will be identified by wooden stakes bearing ribbon. Quantitative observations will include: the physical count of the number of invasive plant species present; the physical count of the number of native plant species present (richness); the incidence of native plant species (abundance); the physical measuring of the height of native species; documentation of the developmental stage of native vegetation (seedling, re-sprouting, mature, or dead); and, lastly, documentation of soil conditions through laboratory analysis. Once the data is collected, analysis will be conducted against previous sets of data to infer where the restoration is within its intended trajectory.

2. Description of Quadrants:

Q1 is a high visibility site toward the north entrance of the garden. It is currently occupied by a hybrid spruce plant, a blue spruce and various exotic trees. Q1 is more elevated than Q3, (implying that the soil is not as wet). This quadrant contains a minimum amount of invasive

plant species and will provide a good picture of how the native plants are doing in the soil conditions. Q2 has a high level of invasive plants, specifically Black Bamboo and Himalayan Blackberry. Q3 has a section of pond bank exposed and a mixed vegetation of invasives and natives. This quadrant will give us a good identification of how the native plants are doing in wetter conditions. Q4 has the highest concentration of invasive plants, providing the opportunity to identify if invasive species are re-establishing themselves quicker than native plants after maintenance phases. Q5 resembles Q1 in hydrology and plant distribution. It will ensure more uniform measurement of site characteristics. (*Note: the above is adapted from the previous report.)

3. Photopoint Comparison:

Ongoing monitoring will additionally include photography taken over time, of the same observation points within the site. This allows for quick assessment of progress, plus comparison between the display garden pre-restoration and the dynamic garden developing as restoration continues. Photopoints have been started at the north entrance, at the pond bank facing the north entrance, and at the strawberry patch between the two southern entrances.

Awareness

1. Condition and Wear:

After designing and constructing benches, a new more extensive signage, their condition should be observed alongside ecological monitoring, so as to prevent deterioration or defacing. Further visual analysis is necessary for the circular pathway within the garden. If wear from use remains low on the south side (as it is today), then facilities management may need to resurface. (If it continues to be low even after increased human presence on the site, a possible avenue might be to leave the pathways to overgrowth from the garden. This would create a more natural beaten-path look, and would provide more space for growing native plant abundance.)

2. Poll:

A random poll could be conducted using Gordon Head, Oak Bay and Saanich community members as well as UVic students and staff, which asks the following questions.

“Are you familiar with the Finnerty Native Plant Garden on UVic’s campus?”

“Do you know where it is located? Have you ever been there?”

“If so, do you visit it rarely, sometimes or often?”

“Are you aware of the restoration project that has begun in the site?”

Responses to these questions can be collated and will inform future groups of local awareness.

Education

1. Communication:

Through the consultation with UVic’s various faculties that will be necessary to implementing the education phase of the action plan, monitoring success in those terms will be inherent to the process of communication. Future groups should be open to their project material being demonstrated in class lectures, and if the project proceeds well then guest talks but long-term volunteers would be a good way to monitor class interest in using the site.

DISCUSSION

“The Disposition of Invasive Non-Native Plants”

Following habitat loss, exotic plant invasions are the largest contributor to native species decline^{3;6;8}. Invasive non-native plant species are a persistent threat to local assemblages usually because of competition, or due to an alteration of ecosystem functions^{2;3;7}. Initial site assessments can often result in calls for restoration based simply from the presence of invasives³. Restoration of an invaded site is often difficult and long-term: their ability to leave behind a legacy harmful to a project’s intended trajectory is heightened by the lack of ecosystem adaptation to their strategies³. This legacy often comes in the form of large contributions to the seed bank or the presence of an extensive persistent rhizomatous network. Continuous maintenance is often required; a complete removal of invasives may not be possible due to their persistent nature³. Repeat actions of removal should be therefore included with replanting for a period of several years or more, in order to conclude whether the site has reached a desirable trajectory or whether further intervention is necessary³. As funding for a restoration project is typically limited, particularly when involving the removal of invasive non-native plants, a prioritization of populations to be removed is essential³.

English ivy (*Hedera helix*), is a ubiquitous invasive exotic plant that shows dramatic growth ability once established¹. It can form a dense ground cover that decreases the penetration of light to the soil below, and will choke out all other vegetation. In a study conducted by Biggerstaff and Beck comparing ivy removal by hand and by spraying, hand removal, though more labour intensive, was favoured due to its ability to completely remove all parts of the plant². We chose hand removal in our own first round of maintenance and suggest it in the future: the germination of dormant native seedbanks is spurred on by the increased light and temperature on soil that hand removal brings². That stated, during the hand-removal of English ivy large areas of soil become barren through that soil disturbance, which can lead to recolonization by ivy and other invasives^{2;3}. Mulching, seeding or planting a site exposed after the removal of English ivy is necessary to create a higher density of native seedlings.

Our Restoration Plan

Based upon referenced literature and the preceding group's report, we developed our restoration plan in terms of restoring a dynamic, not display, garden. Due to the current lack of funding, we concluded that our initial maintenance phases should focus on English ivy and holly, as well as some canary grass choking out the pond's bull-rushes. These are perhaps the most invasive plants within the site, next to black bamboo, for which heavier duty tools will be needed. We also decided that subsequent seeding or planting of native plant species is also essential, but was outside of our ability as a six person group together for only one semester with zero funds. Seeding or planting should be done in a way to promote the FNP Garden's assembly rules, or the "regularized patterns in species co-occurrence" (p. 327)⁴. A dynamic garden seeks to represent its reference ecosystems (in this case swampland and underbrush) to the best of its abilities when changing human needs are taken into consideration. Lastly, we concluded that a more comprehensive and long-term monitoring regime was necessary to accurately measure our redefined and expanded objectives. Our monitoring techniques were conceived to be the substance behind an action plan that is mostly in the realm of the future.

A few more words on our idea of a '*dynamic garden*' are needed. To our knowledge, this concept has not been developed in the terminology or setting that we have worked with and is of our original design. In the same way that exotic plant invasions signal the need for a restoration of ecological resilience, a lack of cultural investment shows that the site cannot adapt ecological to changing human need: it is not dynamic. Dynamism does not necessarily equal autonomy, but if fragment of green space in an urban landscape achieves any degree of autonomy then its dynamic character is clear. Not all gardens can achieve that qualitative dynamic state however – likewise, even the most autonomous ecosystems are not dynamic if they cannot coexist with human use and maintain integrity. In effect we are applying the "working landscape" theory to the garden aesthetic. It is FNP Garden's unique aim to showcase native plant assemblages that makes its eventual restoration as a dynamic garden possible. As much as we seek to alter the site's ecology for an adaptiveness to ongoing human use (as an outdoor classroom/community center), we may also cultivate the cultural: by restoring the ability of humans to exist dynamically in nature

Our Project Implementation

We held our first maintenance event for the FNP Garden restoration on Wednesday, March 18th, 2009; a pull of English ivy paired with homebaked cookies and a few thermoses of assorted teas. A week before our pull, a poster advertisement for the event was created and copies were distributed around campus on bulletin boards. No help ended up coming from outside our group, but such is to be expected at the busiest time of the year.

We contacted facilities management a few days before our pull, then again on the day of. They met us before we started and demonstrated where their own actions on the site had occurred. We were provided with a rake, two wheelbarrows and a tarp, and they picked up the accumulated vegetation after the pull. It was helpful to see through their eyes as gardeners, and they discussed many of the techniques for restoring the ponds and native plant population as we have collected in this report. Before the pull we contacted the ES faculty for additional gear, and professor Val Shaefer provided us with shears, hedgecutters and gloves.

Our efforts were divided into three areas. First, we removed English ivy at the north entrance by hand and with cutters. Working with a partner seemed to work best, where one person would grip a bundle of vine while the other sheared at its roots. Four volunteers clearing one 3ft by 12ft bed of ivy took two hours of solid labour. There are, at least, ten other sections that size to be removed. Second, we uncovered the native strawberry patch is growing along with violets at the garden's southern end. This cluster of strawberries, the largest on UVic, was significantly covered with leaf-fall from the pin-oak (*Quercus palustris*), quite high in acidic tannins. This part of the garden is an attractive area in June when berries begin to form, and is highly visible near both trellised entrances. The monitoring program will make sure that ivy stays out of the strawberry patch, and will document whether or not raking helped promote strawberry growth. Third and lastly, we focused on assisting the nodding onion and pond grasses along the north bank. Several non-native grasses and hedges had been growing there, but their removal has made a large aesthetic difference in the overall look of the pond. We removed leaf litter from the onions to expose the numerous shoots of spring growth. However it appears that rabbits have been grazing on the onion shoots, and so future project implementation should consider fencing them further.

Overall, our group of six people worked diligently on this first round of maintenance but success is hard to gauge without replanting, monitoring, more removals, planting and monitoring, etc. Continuing class participation and engagement in the FNP Garden restoration is likely to increase its reputation as a space for experiential learning (as Mystic Vale and the GOMER area already are). Only then can the goal for a dynamic garden be achieved.

A Future for the Site

We hope that our vision of a dynamic native plant garden will be accepted and welcomed by UVic's students and faculty, as well as by surrounding community members. We believe that the intended trajectory of this restoration is feasible, in both a financial and practical terms. Even in its current state of disrepair there is a sense of quiet and calm isolation to the FNP Garden. Imagine a day when students actively study and work there on sunny days; where snowberry stalk baskets made by an ethnobotany class lay among the strawberry in summer; First Nations art will bring their affirm their traditions in the signage's imagery, the platform's carved walls, and the benches' design; a Cedar Hill resident walking their dog will stop to remove a sprig of English ivy because they have come to care about the site's health.

These hopes seem far-fetched when faced with a stagnant display garden, but they are more than possible in an adaptive dynamic garden. People want aesthetically pleasing gardens as much as they want aesthetic gardens, and ecosystems need to be allowed their autonomy if their ecological resilience is expected to hold onto our cultural investment. A sustainable future for the site, our uses, and our appreciation of it: that is what this project will achieve.

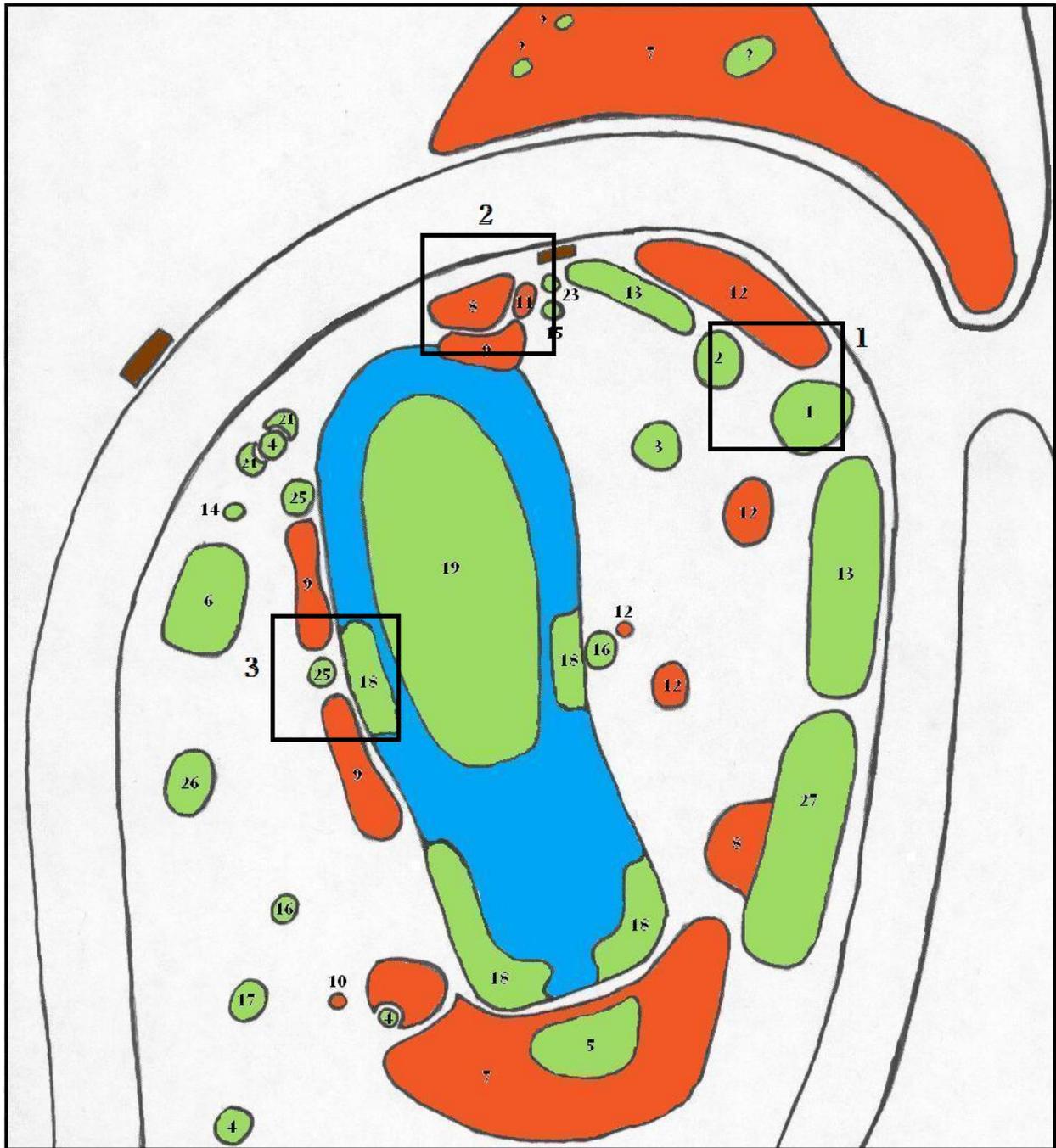
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APPENDIX

Map



Legend for the Map

(*Note: orange = exotics for removal, blue = pond surface, green = native plant cover)

TREES

- 1 Blue Spruce
- 2 Ornamental Spruce
- 3 Japanese Maple
- 4 Common Oak
- 5 Ornamental Evergreen
- 6 Alder

INVASIVE PLANTS

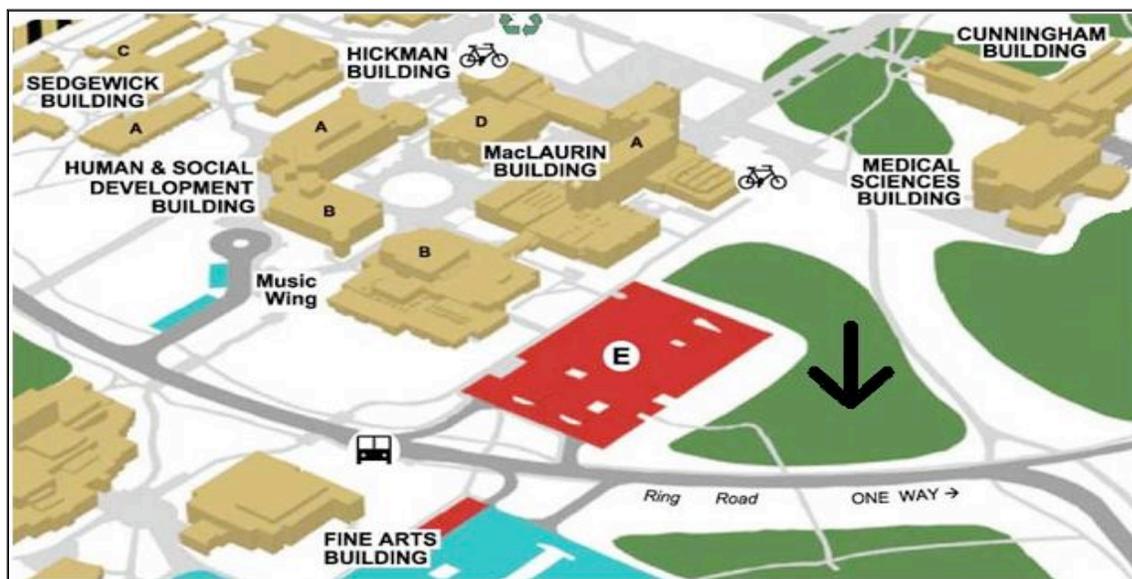
- 7 English Ivy
- 8 Black Bamboo
- 9 Reed Canary Grass
- 10 Holly
- 11 Himalayan Blackberry
- 12 Hedge Hybrid

NATIVE PLANTS

- 13 Nootka Rose
- 14 Snowberry
- 15 Deer Fern
- 16 Lady Fern
- 17 Sword Fern
- 18 Cattail
- 19 Yellow Pond-lily
- 20 Duckweed
- 21 Oregon Grape
- 22 Rosy Twisted Stalk
- 23 Black Gooseberry
- 24 Flowering Current
- 25 Common Russh
- 26 Pacific Ninebark
- 27 Thimbleberry

(*Note: larger numbers near boxes indicate monitoring quadrants; only three of five shown)

Location of Site



Index

The following is an in-depth description and pricing of fourteen native plants among those to be restored to the FNP Garden. Following the recommendations from our preceding group, native seedlings have been selected that best fits their evaluation of the site's current moisture levels, sun exposure, and soil types. Our predecessors also chose these plants relative to the needs of UVic's facilities management; we added selections of plants with consumptive and medicinal qualities based on historical Songhees and Saanich First Nation usage.

(All prices were provided by North Saanich's Russell Nursery, except for that of Stinging Nettle, which was retrieved from the Sand Mountain Herbs website. Seedling prices are given in dollar value per either four-inch-deep pot or 36.5 x 36.5 x 55 mm 'plug'.)

	Bracken Fern (<i>Pteridium aquilinum</i>)
Description:	Deciduous, round stalk, triangular leaves, straw colored to green, with spreading rhizomes.
Height:	Often over 15cm tall.
Growing Condition:	Low elevation, clearings, dry to wet forests, or acidic sites.
Points of Interest:	The world's most widespread fern.
Price:	4" pot , 18 per tray, \$3.60 each

Name:	Broad-Leaved Starflower aka Indian Potato (<i>Trientalis latifolia</i>)
Description:	Perennial, stem erect, whorled leaves, egg shaped, flower: pink or rose, six petals on a curved stalk coming from the center of the leaf.
Height:	10-30cm
Growing Condition:	Open forest, thickets, meadows, low-mid elevation.
Points of Interest:	Tubules were gathered and eaten by some coastal aboriginal groups.
Price:	4" Pot, \$3.50 each

Name:	Broad-Leaved Stonecrop (<i>Sedum spathulifolium</i>)
Description:	Succulent herb with high ground cover, crowded fleshy and flat leaves that alternate from light green to red; flowers: Bright yellow, five petals, pointed, numerous seeds.
Height:	20 cm
Growing Condition:	Rocky outcrops, coastal bluffs, forest openings, coarse soil.
Points of Interest:	Sonhees women chew the leaves of this plant in the ninth month of pregnancy as a means of easing childbirth.
Price:	72 per tray, \$1.20 each

Name:	Common Juniper (<i>Juniperus communis</i>)
Description:	Evergreen, trailing branches, needle-like leaves, prickly, dark green, shedding red-brown bark, small berries bluish when ripe.
Height:	Less than 1 meter
Growing Condition:	Dry soil, rocky conditions, open woods near sea-level to subalpine
Points of Interest:	Traditional used as fumigants, deodorizers, cleansers, and medicine for urinary infection and during childbirth. Berries were not often used as food; however branches and berries could be boiled to make teas.
Price:	4" pot 18 per tray \$2.80 each

Name:	Deer Fern (<i>Blechnum spicant</i>)
Description:	Evergreen, medium sized, two fronds, paired leaflets, oblong leaves.
Height:	20-80cm
Growing Condition:	Moist to wet forest, stream banks , bogs, lowlands.
Points of Interest:	Used by Native people as a medicine for skin sores. Hesquiat elders report seeing deer rubbing their antler stubs on the plant after the antlers have fallen off. An important winter food source deer and elk.
Price:	Plugs 72 per tray \$1.60 each

Name:	Devil's Club (<i>Opopanax horridus</i>)
Description:	Thick crooked stems, armed with large yellow spines, 35 cm Leaves are alternate and maple-leaf shaped.
Height:	1-3 m tall
Growing Condition:	Water collecting sites and nitrogen rich soils. Is shade-tolerant.
Points of Interest:	Very important medicinal plant. The inner bark of the roots is still used to treat arthritis, ulcers and digestive tract ailments.
Price:	4" pot 18 per tray \$3.60 each

Name:	Evergreen Huckleberry (<i>Vaccinium ovatum</i>)
Description:	Bushy, evergreen, alternate egg shaped leaves, flowers: light pink, bell shaped, small, clusters, berries: dark purple, small, round, shiny.
Height:	0.54 meters
Growing Condition:	Coniferous forest edge and openings, low elevation, drained acidic soil.
Points of Interest:	The edible berries, ripen October to November. Native people from the Alaskan to Californian coasts were known to travel far and wide for these berries pre-contact, which are said to better after the first frost. The leaves are high in vitamin C and can be chopped and boiled to make tea. Tea can be useful in stabilizing blood sugar levels.
Price:	Plug 77 per tray \$1.84 each

Name:	Falsebox aka Oregon Boxwood (<i>Pachistima myrsinites</i>)
Description:	Low, dense evergreen, branches are red-brown, opposite leaves are oval and shiny, margins are toothed, flowers: maroon, very small, four fragrant petals, cluster along the branch.
Height:	20-80cm
Growing Condition:	Coniferous forest, rocky openings, dry slopes, low to mid elevations.
Points of Interest:	Good winter food source for deer.
Price:	4" pot 18 per tray \$3.60 each

Name:	Nodding Onion (<i>Allium cernuum</i>)
Description:	Perennial, clustered bulbs smelling strongly of onion; grass-like leaves; flowers: pink to light purple, at the end of each stalk.
Height:	10-80 cm
Growing Condition:	Sandy soil, dry open woods or exposed areas, often around Douglas fir.
Points of Interest:	Nodding onions were eaten by Northwest Coastal Tribes and some from the Interior. Roots were dug and could be eaten raw. However, usually they cooked in pits until black in color. This plant belongs to the same genus as garlic, leeks and chives.
Price:	Plug 128 per tray \$0.90 each

Name:	Skunk Cabbage (<i>Lysichitum americanum</i>)
Description:	Large elliptical leaves often 1.5 m long. Greenish yellow flowers located on a spike. Flowers appear before or with the leaves in early spring, have a distinct skunk smell.
Height:	30-150 cm tall
Growing Condition:	Grows in wet to very wet nitrogen-rich soils. Is shade-tolerant. Usually associated with Lady Fern and Devil's Club.
Points of Interest:	Leaves of the plant were used like "wax paper" for lining baskets, drying racks and steaming pits. Can also be used medicinally for headaches when leaves are crushed and inhaled.
Price:	Plugs 38 per tray \$4.00 each

Name:	Stinging Nettle (<i>Urtica dioica</i>)
Description:	Perennial with spreading rhizomes, stinging hairs, tall upright stalk,; leaves: opposite, narrow oval shaped, saw-toothed; flowers: tinny, numerous and dense, drooping clusters at the leaf axils.
Height:	1-3m
Growing Condition:	Meadows, stream banks, open forest; needs rich moist soil at lowlands to subalpine elevations.
Points of Interest:	Used for fish nets and snares by Native groups. Cooking removes the

	stinging properties of the plant, which can then be eaten.
Price:	\$2.25/ 50 seed packet

Name:	Thimbleberry (<i>Rubus parviflorus</i>)
Description:	Shrub, light brown bark, leaves: large, light green, maple leaf shaped, fuzzy, alternate, flowers: white, large fruit: shallow domed, raspberry-like, clustered red when ripe, sweet, seedy.
Height:	0.5-1.5m
Growing Condition:	Open sites, shorelines, low-mid elevations, can form dense thickets.
Points of Interest:	Edible berries ripen between June and July. These are gathered and eaten by most Interior and Coastal Native Tribes. Berries can also be dried and made into cakes. Young shoots can also be eaten.
Price:	Plug 72 per tray \$1.15 each

Name:	Trailing Blackberry aka Dewberry (<i>Rubus ursinus</i>)
Description:	Trailing, leaves: alternate, deciduous, dark green, toothed, flowers: white or pink, clusters from leaf axils, fruit: black.
Height:	50 cm
Growing Condition:	Disturbed areas, open forest; can behave like a weed in urban areas.
Points of Interest:	Edible berries can be harvested in July. Female and male plants are separated, and the male plant does not produce fruit. Leaves can be made into tea, and have been used as medicine to remedy diarrhea, dysentery, cholera, excessive menstruation, fevers and mouth sores.
Price:	Plugs 72 per tray \$1.15 each

Name:	Wapato aka Arrowhead (<i>Sagittaria latifolia</i>)
Description:	All leaves are at the base and are shaped like an arrowhead. The leaves are 25 cm long and stay above water. Flowers are small and white and grow in whorls of 3 on a long stem. The plant has a thick over-wintering rhizome as a root system.
Height:	20-90 cm tall
Growing Condition:	Semi-aquatic plant, grows in marshes, ponds and lakes. Usually rises above water but can be partially submerged.
Points of Interest:	The rhizomes and tubers of the plant are eaten by ducks, muskrats and people. First nations of the Columbia baked the Wapato tubers and relied highly upon their high starch content to treat indigestion. A leaf tea was used to wash young children with fevers.
Price:	Plugs 38 per tray \$2.00 each

Photopoint Photography

Pond Before



Pond During



Northern Ivy Before



Northern Ivy During



Southern Strawberries Before



Southern Strawberries During



Current Group

This report has been the result of many hours of coordinated group work. Although each major section was generally written individually, the successes present in this piece are all shared. The team met several times over the span of this report's draft; the visions, goals, and aspirations of the project are all the product of six minds' collaboration. A strong and positive group dynamic began to emerge early in the process. Ideas were often reinforced by the opinions of other group members while the team's approach remained diverse thanks to differences in academic backgrounds.

No one section received the exclusive attention of a single team member – instead, each part of the project is the product of a small and effective network of passionate novice restorationists. So, without disagreement or debate, we have reached a consensus was that a “communal mark” should be given to the authors of this report rather than an individual one.

Thanks for reading!