Towards A Future for Mystic Vale

University of Victoria
Environmental Studies 341
Restoration Design Project

Professors Eric Higgs & Brian Starzomski
November 26, 2009

Manuelle Chanoine
Jori Baum
Daniel Struthers
Karin Campbell
Table of Contents

1.0 Introduction .................................................................................................................. 3

2.0 Site Analysis ................................................................................................................ 4
2.1 Site Location and History ............................................................................................ 4
2.2 Site Description .............................................................................................................. 5
2.2.1 Vegetation .................................................................................................................. 5
2.2.2 Mammals .................................................................................................................... 6
2.3 Problem Identification .................................................................................................. 7
2.3.1 Fragmentation and Lack of Resources ...................................................................... 7
2.3.2 Lack of Community Awareness and Education ......................................................... 8
2.3.3 Human Disturbance .................................................................................................. 10
2.4 Past Restoration Efforts ............................................................................................... 11

3.0 Goals & Objectives .................................................................................................... 14
3.1 Policy Statement .......................................................................................................... 14
3.2 Goal One and Objectives ............................................................................................ 15
3.3 Goal Two and Objectives ............................................................................................ 18
3.4 Goal Three and Objectives .......................................................................................... 21

4.0 Project Design ........................................................................................................... 27
4.1 Fundamental Organization of the Restoration Plan ....................................................... 27
4.2 Scope of the Restoration Design .................................................................................. 29
4.3 Scientific Design ........................................................................................................... 31
4.4 Risk Management of Project Design .......................................................................... 33
4.5 Practicality of Implementations .................................................................................... 35

5.0 Monitoring and Evaluation ...................................................................................... 36
5.1 Introduction .................................................................................................................. 36
5.2 Monitoring the Goals and Objectives of this Plan ....................................................... 37
5.3 Long term monitoring of Mystic Vale through Education Programs ............................ 44
5.4 Evaluation ..................................................................................................................... 45
5.5 Reporting ....................................................................................................................... 46

6.0 Conclusion ................................................................................................................. 47

7.0 References .................................................................................................................. 48

8.0 Appendixes ................................................................................................................ 49
1.0 INTRODUCTION
BY MANUELLE CHANOINE AND JORI BAUM

In order to emphasize the importance of restoration in Mystic Vale, we have created a design project which addresses the major concerns of the ecosystem. Though we recognize that there is a wide variety of factors contributing to the degradation of the landscape (biotic, abiotic and cultural), it is impossible to offer a solution to each one within the constraints of this particular project. Therefore, we have created the design project under one umbrella theme which provides a link between all of the individual issues in the vale: raising awareness and education through community engagement.

This report will cover a historical description of Mystic Vale and past restoration efforts that have occurred at the site. A general site analysis will describe current biological and cultural conditions and the identification of problems in regards to the habitat and its restoration will be addressed. These concerns will be the basis for which our goals and objectives are shaped. The project design will cover the implementation of our goals and objectives as well as a risk assessment and feasibility of the project. Finally, the monitoring section will address how the plan will be carried out in the long-term and how it will be evaluated. Although this report does not cover a budget and timeline, this restoration project will be based on community involvement and therefore volunteer labour but overall will also require a large commitment from the University of Victoria. Mystic Vale is an aesthetically, ecologically, and culturally significant space that deserves the time, effort, and appreciation our project design would like to create.
2.0 Site Analysis
By Manuelle Chanoine

2.1 Site Location and History

Mystic Vale is a forested natural area on the University of Victoria (UVic) campus which encompasses 4.7 hectares (or 11.6 acres). The campus is situated on the traditional territories of the Straits Coast Salish peoples, which include several different communities such as Senchalhen, or Saanich, and Lekwungen, or Songish. Through traditional practices, these people played an important role in the management of the landscape for thousands of years. Today, Mystic Vale is classified as a “sensitive ecosystem” by the municipal sensitive ecosystem inventory due to its unique ecological characteristics (Harrop-Archibald, 2007). For the purposes of this restoration project, we will refer to both Lower Hobbs Creek or Mystic Vale as well as Upper Hobbs Creek, treating them together as one ecosystem that needs to be jointly restored (Harrop-Archibald, 2007). According to the UVic Campus plan of 2003, only the Mystic Vale area is protected from development in perpetuity (see Appendix A). However, Mystic Vale is not protected from human use, and there are many factors contributing to the degradation of this once native environment.

Like much of the West coast landscape, the land that now comprises UVic has seen many changes since the arrival of the European settlers in the late 1800’s. By the 1950’s, the area had been logged, farmed, built on, and used for military activities. “Before becoming a university, about 46% of the original 105.6 ha (261 acres) of land had been cleared and used as army training grounds. The remaining southern area had been logged by the Hudson’s Bay Company and contained second growth forest” (University Campus Plan, 2003, pg. 10). In 1959, 120 acres of land was purchased for the construction of
Victoria College. By 1963, Victoria College had been transformed into the University of Victoria and occupied 380 acres of land in Gordon Head. Currently, the university straddles two municipalities: the south portion of the campus rests within Oak Bay and the north portion rests within Saanich (Harrop-Archibald, 2008).

Due to its unique location on the southern tip of Vancouver Island, the Mystic Vale ecosystem provides an important contribution to the biodiversity values of the province. The exact coordinates for UVic are located at 48° 28”N and 123° 19”W on southern Vancouver Island. “The area is in the Coastal Douglas-fir biogeoclimatic zone, which lies in the rainshadow of the Olympic Mountains and the mountains of Vancouver Island” (Harrop-Archibald, 2007, pg. 3). The moderate climate is characterized by mild, wet winters and warm, dry summers. This unusual climactic regime for coastal British Columbia results in a diversity of ecosystem types and relatively high productivity. More than just being environmentally important, Mystic Vale contributes significantly to UVic’s visual image, and has been actively used as a resource for teaching and research. The trees have substantial aesthetic value because they are the first view of the campus from its major south and west entrances (Campus Plan, 2003).

2.2 Site Description

2.2.1 Vegetation

Mystic Vale is part of the Hobbs Creek watershed, one of four on the UVic campus. It lies on moderately steep slopes ranging from 20° to 30°. The ravine is originally coniferous woodland which supports primarily Douglas-firs, grand-firs, and big-leaf maples: stand age and diameter data indicate that the oldest trees are between 100 and 150 years old.
According to Hocking (2000, as cited in Harrop-Archibald, 2008), the vale’s flood plains and moist conditions would normally support Western red cedars although few (if any) are still present. As Peter Roberts from Facilities Management explained, the upper edges of the vale support species such as arbutus, salal and Oregon grape, while the lower edges of the ravine (close to Hobbs Creek, where the soil holds more moisture) support species such as Pacific water parsley, skunk-cabbage and false lily-of-the-valley. The understory vegetation also consists of both native and non-native species: native to the area are the oceanspray, snowberry, Indian plum and sword fern, while English Ivy is non-native. For a complete list of the wide variety of vegetation in Mystic Vale, please refer to the University of Victoria Natural Features Study.

2.2.2 Mammals

Mystic Vale is also home to a variety of mammals. Residents of the ravine include black-tailed deer (which can be sighted on campus daily), racoons, gray squirrels, eastern cottontail rabbits, and bats (Lucey et al., 2002, as cited in Harrop-Archibald, 2008). The trees are home to the nests of the Bald Eagle (*Haliaeetus leucocephalus*), Cooper’s Hawk
(Accipiter cooperii) and the Great Horned Owl. For a more complete list of resident mammals in Mystic Vale, please refer to the University of Victoria Natural Features Study.

2.3 Problem Identification

2.3.1 Fragmentation and Lack of Resources

One of the major problems concerning Mystic Vale is the fragmentation within the organization and funding of its restoration. According to Peter Roberts, restoration efforts have been sporadic. The discontinuity of staff positions in the Facilities Management department inhibits consistent restoration, and there is a lack of financial resources to maintain the vale in good condition.

1. There is no overriding coordinator to ensure continuity in the restoration of Mystic Vale.
2. There is no united body of people (such as a Steering Committee) to identify and address new and old concerns.
3. There is no easy access to formal reports or documentation on the restoration of Mystic Vale.
4. Restoration efforts in Mystic Vale need to be approved and supported by the university as well as by the municipalities of Oak Bay and Saanich.
5. The University and municipalities do not provide the appropriate departments with adequate and consistent funding to undertake significant restoration projects.
2.3.2 Lack of Community Awareness and Education

Though the Mystic Vale ecosystem is critically important to the ecology of Vancouver Island, none of its users are aware of the significance of the area. Currently, there is little to no information available to the public about the issues concerning the vale and the importance of restoration. According to Facilities Management, the two major concerns for the vale are: invasive species and soil erosion.

i) Invasive Species

With time, invasive species hold the potential to completely alter the forest community, resulting in a major shift in vegetation dynamics and species composition. They have the ability to reduce seedling recruitment. They also compete with native shrub and plant species for light, soil nutrients and sunlight to spread across the forest ground. Such species as English Ivy which have the ability to climb are able to stress and kill trees by competing for those same assets (Harrop-Archipald, 2008). English Ivy also creates the effect of a sail on trees, increasing the chance of blowdown in windy conditions.

*English Ivy*
Other common invasive species found in Mystic Vale include the Himalayan blackberry, scotch broom, daphne-laurel, the English hawthorn and the deep-rooted English holly. Most of these were introduced purposefully by colonists from Europe, who tried to bring their own backyards with them when they moved to the new country (Turner, 2000). These plants were therefore not considered a threat to native species until they had already taken a strong hold on the Mystic Vale ecosystem.

**ii) Soil erosion**

Soil conditions are a concern because of the combined effects of compacted, poorly drained soils and highly impervious surface coverage: these factors limit the root depth of trees to the superficial soil layers. “These shallow roots, in conjunction with the tree exposed to wind at the periphery of developed lands, result in increased potential for blowdown” (Harrop-Archibald, 2008, pg. 26). Moreover, stressed trees, due to soil compaction and poor soil water conditions, are thought to be vulnerable to attack by both bark beetles and root diseases (Hocking 2000, as cited in Harrop-Archibald, 2008).

Another factor which should be noted is that the removal of English Ivy has led to increased soil erosion. Ivy is a plant which holds up the bank particularly well, and the slope erodes faster when there is no understory to support it.
2.3.3 Human Disturbance

Human disturbance is a problem which goes hand-in-hand with the lack of community awareness and education. Mystic Vale is frequented daily by many walkers, joggers, dogs, bikers, etc. Though use of the vale is encouraged for teaching and research by the university and for leisure purposes by community members, it must be recognized that human disturbance has a significant impact on the ecosystem of the vale.

i) Trails

Trails are the most commonly used surfaces of the vale, and that ground receives the most continuous impact. The soil has become so compacted that it cannot provide the adequate nutrients for any species to grow, whether native or non-native; it is also used so frequently that vegetation does not have the time to grow in.

The impact of trampling on ill-placed trails is also a contributing factor to the problem of erosion. Unrestricted public access to the riparian zones of the ravine creates
erosion of the stream channel and banks all along Hobbs Creek (Harrop-Archibald, 2008).

Moreover, the trails are often treated as a simple guideline for those who use the vale: dogs, walkers and bikers tend to trample areas away from the trails, increasing soil erosion and stunting the growth of plants. These areas are especially affected when trails are wet and muddy in the fall and winter months (and therefore people walk around the trails), as well as in the open areas where invasive species have been removed.

2.4 Past Restoration Efforts

According to the 2003 Campus Plan, UVic is committed to the preservation of the entire forested area associated with Mystic Vale “to ensure the long-term health of the area as habitat for local flora and fauna” (pg. 18). Since its purchase in 1993, work conducted in Mystic Vale includes creek stabilization measures, removal of invasive plant species, and trail enhancements (Campus Plan, 2003). However, there is no formal, accessible documentation on the restoration of the area.

As explained by Peter Roberts from the Facilities Management department at UVic, the restoration priority in Mystic Vale was to “save the trees.” In 1995, staff from the grounds department began to remove all of the invasive species from the trees, starting at the lower end of the vale and working their way up. Since the roots of English Ivy are not very deep, “removal” simply refers to the manual extraction of the plants; no chemicals have ever been used. The most common invasive species which the trees have to compete with for water, soil nutrients and light is English Ivy; other species which may also affect the health and growth of trees include English Holly, daphne-laurel, and scotch broom.
Though the removal of English Ivy has been successful, the solution is not permanent: after ten years, it is evident that the plant is slowly starting to spread again. Roberts explained that we need to start thinking about alternatives to ensure the re-growth of dormant native species.

Since 2001, specific restoration efforts have been undertaken to address the hydrology concerns in Mystic Vale. According to Lucey et al. (2002), a large quantity of sediment was removed from the delta of Hobbs Creek at its juncture with Mystic Pond. Emergency remediation measures in the form of temporary weirs were implemented in response to the rapid loss of stream channel and bank structure. As of 2002, the prescriptions appeared to be effective in minimizing bank erosion, stabilizing downstream sediment movement, and initiating the process of elevating the stream channel bottom. The latter process is essential for the stream to regain its functional use of the floodplain during high flow events (Lucey et al. 2002). This has slowed erosion considerably, and without these measures the channel would likely have downcut to a point where it could not be rehabilitated.
Permanently stopping the erosion is a slow process however; erosion is therefore still occurring and will continue to occur for some time. As an example, the pond at the end point of Mystic Vale still receives a significant amount of sediment. Though the sediment was removed from this pond in April 2001 through a cooperative effort by UVic, the District of Saanich and the owner of the pond, heavy rains in the fall of 2003 caused the pond to fill up once again. This sediment load puts lower Hobbs Creek and Mystic Vale pond at high risk of heavy sedimentation and could undo restoration works undertaken in the last three years. Large wood pieces were also used to stabilize bank erosion, and public access to some stream bank areas has been restricted to allow riparian vegetation to re-establish (Lloyd 2004). As well, Facilities Management transplanted willows and cornus to slow the erosion of the slope, but the experiment was unsuccessful because the creek dried up during the summer months and the trees did not survive.

Therefore, though the department has invested significant time and funds 1995 to remove invasive species and remediate the stream course since 1995, Mystic Vale still requires continuous attention.
3.0 Goals & Objectives

By Jori Baum

3.1 Policy Statement

To establish a permanent and reliable long-term restoration plan for Mystic Vale that highlights education as a means of raising awareness and addressing ecological issues in the Vale.

Mystic Vale will be a site for restoration education in order to raise awareness around ecological issues in the Vale, to apply classroom knowledge in a practical setting, and to engage people with their natural environment. In addition, we would like to reduce human caused disturbance while continuing human usage.

The values on which we are basing our restoration plan are predominantly social and cultural but in doing so we believe that the ecological components of the Vale will benefit in reaction to increased human care. Our values for this project include education and awareness, commitment, environmental stewardship, social engagement, community participation, and an overall theme of connecting people to place for the benefit of both.

Eric Higgs states in his book Nature by Design that “what is so distinctive about restoration as a practice is that it builds value in participation, and in doing so strengthens human communities. Restoration is doing well when it nourishes nature and culture” (2003, pg. 226) – our restoration project is founded on this last statement.

Our goals and subsequent objectives rest heavily on getting to the root of the problem regarding the restoration of Mystic Vale. As described previously, restoration efforts to date have been fragmented, discontinuous, and poorly documented. We therefore wish to remedy those issues by creating a plan that is reliable, permanent, long-term, and organized. This section will outline our three basic goals followed by the objectives that we
see fit to accomplish those goals. Our plan will require a large commitment from the university and additional stakeholders but remains within and compliments the intentions of the University of Victoria, particularly the Office of Campus Planning and Sustainability.

3.2 Goal One

*To ensure effective, efficient, and engaging restoration activity in Mystic Vale at present and in the long-term.*

**Objective One:** *To establish a permanent Site Coordinator position.*

Our first objective for the whole project will be the appointment of a Site Coordinator for Mystic Vale. We see this position as existing within the Office of Campus Planning and Sustainability at UVic. This would be a permanent full-time and paid position. It would be awarded to someone with a good working knowledge of university policy and proceedings, a background in restoration and environmental education, and who has the experience and skills to run a multitude of programs. In reality it may be more feasible for this position to be a Natural Areas Coordinator for all natural spaces on campus, but for this project we would like to devote the position solely to Mystic Vale.

Major tasks of the Site Coordinator would be to address problems that have historically been of issue in Mystic Vale. These include, but are not limited to, a lack of documentation and proper recording of what has been done in the Vale, a continuous and committed plan to restoration in the Vale, ecological concerns such as soil erosion and invasive species, as well as improper and destructive usage of the Vale by humans and their dogs.

A similar position to the one we envision came available last year, 2008, at the Iris Griffith Interpretive Centre on the Sunshine Coast of British Columbia. The Ruby Lake
Lagoon Nature Reserve Society was seeking a Wetland and Water Program Coordinator (British Columbia Working Group and Network on Sustainability Education, 2008) and many of the tasks that were outlined in the job description would be similar to the Mystic Vale Site Coordinator. Adapted for UVic, these would include:

- Working with and engaging stakeholders in planning and activities
- Developing a long-term action plan for Mystic Vale
- Developing a short and long-term system for monitoring and evaluation
- Planning and coordinating educational workshops and activities for student and community groups
- Increasing public engagement and participation in restoration activity
- To oversee and help carry out restoration and habitat enhancement activity
- Planning and coordinating program/educational offerings including workshops, lectures and events
- Coordinating and leading community restoration workparties
- Recruiting, training, educating, and managing volunteers
- Participating in outreach and networking activities
- Preparing and distributing communication materials (ex. brochures)
- Coordinating and assisting with fundraising efforts
- Completing project reports, evaluations, general documentation
- Coordinating and overseeing various other managerial tasks

The Site Coordinator would work closely with all stakeholders in Mystic Vale to ensure all planning and activities are agreed upon and accepted by everyone involved. This
would require an accurate representation from each group that has involvement in Mystic Vale, such as the Districts of Saanich and Oak Bay as well as private landowners.

Objective Two: The creation of an overseeing body, a Steering Committee, with representation from all stakeholders and community partners in Mystic Vale.

Our next objective is to create a Steering Committee, a group of people representative of all parties involved in Mystic Vale, who would meet regularly to discuss activity that has been done recently or the possibilities of future activity. This committee will be comprised of various people, groups, and organizations that have an influence or interest in, or are affected by actions that take place in Mystic Vale. It will be up to the Site Coordinator to identify the stakeholders, determine their requirements, and invite them to sit on the committee. Some stakeholders we believe to be crucial to this project would include someone from Campus Planning and Sustainability, someone from Facilities Management, a member from the area’s First Nations community, someone from the District of Saanich and from the District of Oak Bay, the private landowners whose properties encompass part of Mystic Vale, someone from the Department of Fisheries and Oceans (because of Hobbs Creek), and someone from the Citizen Canine Dog Owner’s Association. Other possible representatives that could be invited would include someone from the School of Environmental Studies, someone from the Restoration of Natural Systems Program, and anyone from other departments or administration on campus, another representative of the dog walkers in the area, and possibly someone from the Capital Regional District. Additional invitations could be sent out as needed.

The Steering Committee would meet on set dates throughout the year, for example once a month, quarterly, bi-annually, depending on the needs of the Site Coordinator and
what activity and planning is taking place in the Vale. They would be in charge of hearing updates from the Site Coordinator, giving input and advice to the Site Coordinator, and to make consensus-based decisions to guide initiatives in the Vale.

The Steering Committee could be modeled after other like-committees that exist in the area such as the Bowker Creek Initiative Steering Committee (see their website for more details).

Initially the Steering Committee will be needed to assist the Site Coordinator in developing a long-term action plan for Mystic Vale. Once a plan has been created, the Steering Committee will act to oversee all implementation of that plan. They will also be a large part of evaluating success. Although the majority of the work done in Mystic Vale will be the Site Coordinator’s responsibility, the Steering Committee will exist to assist the Site Coordinator in making decisions, to represent their party in the process, and to contribute to the overall success of the educational and restorative plans for Mystic Vale.

3.3 Goal Two

For Mystic Vale to become a site for restoration education and community involvement.

**Objective One:** To create an Education Program that brings students, classes, and other community groups into Mystic Vale to perform restoration activities that address the ecological concerns in the Vale.

The Education Program, designed by the Site Coordinator, will be the main way for restoration activities to be undertaken and completed in Mystic Vale. Not only will restoration activity done by students and other community members provide those people with the experience of participating in restoration, we are hoping that it will be a significant way to create a sense of environmental stewardship amongst those involved. In
addition, it will be a site for practical learning for UVic and other students, something currently lacking in many curriculums. Finally, having students and other volunteers doing the work means free manual labour the university would otherwise have to pay for.

As discussed in the previous section, there are numerous ecological issues that are of concern in the Vale. The Education Program could involve the Site Coordinator designing short workparties in which members of the community are invited to a Saturday morning ivy pull, and yet it could also be more extensive. For example, the Environmental Studies Ecological Restoration class (ES 341) could be in charge of designing a project, including implementation, and actually going ahead – with the close monitoring and approval of the Site Coordinator of course – and performing their restoration project in Mystic Vale. This would give students a very in-depth experience into what ecological restoration involves.

The Site Coordinator could also work with teachers, professors, leaders of community groups, and other interested parties to develop specific projects for that particular group. Involving community and socially engaging a number and variety of different people and parties would help to raise awareness around local ecological issues and to create a bond between an environment and those people who experience it. Overall, the Education Program would be the link to fulfilling restoration work in the Vale as well as generating environmental stewardship amongst those involved.

*Objective Two: Sign Project Part A – to install a series of interpretive signs detailing the history and ecology of Mystic Vale.*

As part of our campaign to use Mystic Vale as a site for education, we believe that by educating people on the history of Mystic Vale, the past restoration efforts that have taken
place there, as well as general ecological facts of the Vale, people will be more inclined to help care for this environment.

Figure 3.3.2 below presents a map of Mystic Vale including the Upper Hobbs Creek area and indicates the possible location of signs for project Part A.

Figure 3.3.2 shows a graphic enlargement of Mystic Vale with the proposed locations of Signs in Project Part A. Source: map drawn by Karin Campbell, adapted from Harrop-Archibald, 2007, and used throughout

These locations are proposed because they are either entrances to Mystic Vale or high traffic areas where a lot of people will see them. In particular, the creation of a central welcoming and message board at the university entrance to Mystic Vale (corner of Parking Lot 1) would be the primary method for the Site Coordinator to communicate activities and
events as well as current or future restoration projects that are taking place in Mystic Vale. A vision for this message board can be seen below in Figures 3.3.3 and 3.3.4.

![Image](Figure 3.3.3 - Before taken by Jori Baum) ![Image](Figure 3.3.4 - After drawn by Jori Baum)

Other signs in this initiative could alternate between historical knowledge and ecological facts. Information on the history of Mystic Vale can include what Mystic Vale used to be used for and by whom, when UVic took possession of the Vale, and what restoration projects have taken place there since that time. Ecology signs could include information on the types and species of flora and fauna that live in the Vale, the history and ecology of Hobbs Creek, and also the ecological issues that exist in the Vale. The aim of this sign project is to increase public knowledge and interest in the Vale. Our desired outcome is that people will have more of an appreciation for restoration work and an increased desire to help protect Mystic Vale. This project is aimed not only at students and the university community but also at all the other users of the space.

### 3.4 Goal Three

*To reduce human impact and disturbance while facilitating human usage.*
Objective One: To install a series of boardwalks and hedges to direct foot traffic in Mystic Vale. We believe in the importance and benefits of people interacting with nature and spending time in natural settings but we also recognize the damaging effects that continuous disturbance can have on an ecosystem. At present, the adjacent CJVI lands south of Mystic Vale are used as a dog walking park where owners are allowed to let their dogs run without a leash. Although there is a sign put in place at the entrance of Mystic Vale from CJVI that indicates that dogs must be on a leash while in the Vale, observation reveals that few users obey the sign. In fact, at the time this project was put together, the line stating dogs must be leashed was completely destroyed. In addition to the damage done by dogs running free in Mystic Vale, the compaction of the soil on the main user trails creates fragmentation of habitat. In the wet winter months the trails in the bottom of the vale become muddy and impassable and users begin to trample the adjacent vegetation to create a new pathway. This tendency widens the already compact soil and destroys more vegetation. Likewise, a number of users have ventured off the main pathways to create side paths of easier access to outside the Vale. Peter Roberts with Facilities Management also identified bikers as a cause of these side trails.

The creation of boardwalks in the place of main trails in the bottom of Mystic Vale would deter people from leaving the main pathway and would prevent further compaction of soil and destruction of vegetation. Pathways that exist at the top of the Vale do not appear to be affected by rainfall and the trails do not become overly muddy. We propose that those trails are left in shale however hedges could be put in place alongside the trail to prevent users and their dogs from venturing off the main pathways. Figure 3.4.1 shows the proposed locations of the new boardwalks.
Figures 3.4.2 and 3.4.3 below show a visionary illustration of what boardwalks replacing pathways could look like.
In addition to a continuous boardwalk running through the bottom of the Vale and up the two stairways, we propose constructing a large platform at the bottom of the Vale where the two stairways meet and cross the creek. At present, November 2009, the area in question has been severely damaged and compacted (see Figure 3.4.4) and a platform would allow the recovery of the soil and vegetation underneath. Furthermore, the platform would act as a central meeting location for users and classes. It is a site where signs from our projects would be located as well as sitting benches. This compliments our desire to create and encourage spaces where people can interact with and enjoy nature while causing the least disturbance possible. See Figure 3.4.5 for a vision of the future space.

![Figure 3.4.4](taken by Jori Baum)

![Figure 3.4.5](drawn by Jori Baum)

**Objective Two: Sign Project Part B – to install a series of signs detailing basic guidelines to help protect and care for Mystic Vale.**

The second component of our sign project will aim to give basic guidelines to users on behaviours and actions that are helpful in protecting and reducing harm to the sensitive habitat. As discussed before, trails are often damaged by rainwater and people expand them to avoid muddy puddles, and the construction of boardwalks will help alleviate this
stress. However, the boardwalks will only partially direct those users who tend to stray off
the main pathways and create new trails in the Vale. Signs encouraging users to stay on the
trails will be necessary. In addition, basic behaviours like using the garbage cans provided,
picking up after dogs, and keeping dogs on leashes will also be featured in Sign Project Part
B. These signs will use a language that encourages people to protect the space without
them feeling they are being controlled and regulated. Figures 3.4.6 and 3.4.7 are examples
of signs, following the design of current university signs, that could be part of this project.

Figure 3.4.6

Figure 3.4.7

Similar to the placement of signs in project Part A, we will locate the signs in Part B
at major entrances to Mystic Vale and at the meeting platform at the base of the Vale
because it is a high traffic area. More signs could be placed in the Vale as needed. See Figure
3.4.8 for a map of the possible locations of signs in both Part A and Part B.
All of our goals and objectives developed for this project are aimed at the root of the problems in Mystic Vale. This natural area is set amidst a developed and human occupied landscape which has great impact on the sensitive ecosystem in the Vale. We propose that by designing programs, placing signs, and altering the usage of this space we can alleviate a lot of the stress on this environment. A Site Coordinator will be an overall care-taker of this space, guided and encouraged by a Steering Committee. Since this area is located and owned by a university, it is logical that it be used as a site for education, while in turn the Education Program can increase awareness of problems and increase stewardship of this space. Allowing people to continue to use this space but building boardwalks and directing human foot traffic over the same trails eliminates a large amount of human disturbance. Our sign projects will create a connection between the people using Mystic Vale and its environment by informing them of the Vale’s history, its ecology, its problems and how users can help to protect and care for this cherished space. The project design in the following section will further detail important considerations of our goals and objectives.
4.0 Project Design

By Daniel Struthers

This section will be used as a guide for the important topics that this restoration plan needs to cover. The restoration plan does not go in great depth of the steps for implementing the objectives because this is seen as a job for the Site Coordinator and Steering Committee. Instead the fundamental steps for the project will be set up as a fundamental template for the project which can be further adapted by the Site coordinator and Steering committee. After examining the fundamentals steps of the project, further analysis of aspects of this design will be examined. First looking at the spatial and temporal scope of the project will be considered. Next, the importance of scientific design for accomplishing the goals and objectives will be discussed. In the next section, Analysis of the risks that could affect the restoration project will be examined. The final topic covered will be the practicality of the objectives for this restoration plan. For showing why these options for restoration have been decided as being the best practices in this restoration project.

4.1 Fundamental Organization of the Restoration Plan

Below is the basic framework of the restoration project. Keep in mind that the Site coordinator and Steering Committee should be continuously monitoring and discussing site conditions and objectives to eliminate unforeseen circumstances so effectiveness and efficiency can be maintained.
Step 1: Hiring a Full time Site Coordinator.

- Important for organization of restoration plan, implementations, monitoring, evaluation.
- Important for moving the project forward to achieving goals and objectives
- Important for leadership, motivation, and engaging people into the project.

Step 2: Creating a Mystic Vale Steering Committee.

- Allow people to get their word across in what they think is required for restoring Mystic Vale.
- Also important for maintaining organization and structure of the project

Step 3: Building Communities Education and Engagement

- Engaging UVic students and faculty, UVic classes, and clubs in the restoration of Mystic Vale
- Extend the project into surrounding communities of Mystic vale, for example, engaging dog walkers, First Nations people, and neighbouring landowners.

Step 4: Site Implementations

- Creation of Boardwalks in High traffic area to eliminate/reduce disturbance
• Snowberry hedge systems to reduce trample by dogs and humans off the trail system
• Changing Trail system to reduce stress within the ecosystem, particularly within the riparian zone of Hobbs creek.
• Part A and B on Awareness signs
• Invasive species removal program
• Re-vegetate and re-wilding program

Step 5: Monitoring, Evaluation, and Adaptations

• Continuous monitoring of the success for various implementation, both short term monitoring and long term monitoring is important.
• Evaluation whether implementations succeed or failure and recorded for future reference.
• Adaptations to restoration prescription may need to be done. New scientific research and unseen problems may arise that need revisions in the project design.

4.2 Scope of Restoration Design

Setting a scope, both spatially and temporally, for this project is a fundamental step in the restoration design. Scope is defined as the extent of physical intervention (spatial) over the measured timeframe (temporal). Knowing the spatial scope of the project design is important for understanding how much work has be put in to restoring Mystic Vale. The spatial scope will have a linked temporal scope (or timeframe) for the project. The
components of the plan vary from short term to long term commitment as well as varying amounts of intervention.

Once a Site Coordinator and the Steering Committee are set in place meetings should be set up to address the scope of this project because being as organised as possible will lead to a successful result. How large the scope is depends on the goals and objectives that are needed to be met. Below are the goals and objectives of this restoration project as well as a brief discussion of the scope of them.

**Goal 1:** *To ensure effective, efficient, and engaging restoration activity in Mystic Vale at present and in the long-term.*

Objectives:

1) Hiring a paid full time Site Coordinator

2) Creation of a Steering Committee for Mystic Vale

**Goal 2:** *For Mystic Vale to become a site for restoration education and community involvement.*

Objectives:

1) Create an education Program at UVic and with other surrounding communities.

2) Part A of Awareness Signs: Wildlife and Vegetation

**Goal 3:** *To reduce human impact and disturbance while facilitating human usage.*

Objectives:

1) Create Boardwalks

2) Part B of Awareness Signs: Restoration signs
This project will have a large temporal and spatial scope based on the needs of this restoration project. The degree of intervention in Mystic Vale will need to be quite significant and will require a long term intervention plan. Implementing a Site Coordinator and creation of a Steering Committee will be long term initiatives and building an Education Program will be important for success in the short term as well as long term. Building boardwalks and creating the awareness signs will take a relatively short temporal scope but will have a significant spatial scope. Boardwalks can be built in a relatively short period of time. But, ecologically, would have a great significance of generations to come. Boardwalks will reduce disturbance allowing the integrity of the ecosystem to return; which is predicted will take a long period of time. The signs would be very important in the awareness of the wildlife and vegetation community in the vale as well as the restoration procedures being implemented. As wildlife and vegetation is reintroduced back into Mystic Vale and new restoration projects get underway, signs will have to be updated accordingly. Overall the scope of this project is quite large. It is designed for a long continuity well into the future. With this project we hope plant the roots of this project deep into UVic’s long term scope.

4.3 Scientific Design

Mystic Vale is very complex system and successful restoration will take more energy than what was thought to be necessary. Successful restoration will need to be based around adaptive management. Also the Principles and Guidelines for Ecological Restoration booklet explains the importance that "...ecological restoration should follow a hypothesis-testing model that is consistent with the ‘learning by doing’ approach. Once an
implementation is done, it is imperative that it is recorded, monitored, and then determine if it was a success. The Site Coordinator position will be important for keeping the restoration project following the scientific design. There will always be room for building on objectives in a scientific way. With a Site Coordinator position the records of success and failure can be kept to allow for future reference if needed. Allowing for a scientific design will increase the effectiveness and efficiency of this project for the long term.

Inevitably the project is going to run into problems. Ecological restoration is very complex and every ecosystem will bring variations in abiotic and biotic components that will create obstacles for obtaining success. When restoration begins in Mystic Vale, the response by the ecosystem may not be the response that was predicted because ecosystems are dynamic and always changing. Implementations of the objectives that were created may not reach the predicted level, or worse, the objectives may fail altogether. This Restoration design makes it imperative that it be adaptively managed by the Site Coordinator and the Steering Committee to learn what needs to be done with “learning by doing’. It is also important to use ecosystem referencing. Look at preserved or restored ecosystems that are ecologically similar to Mystic Vale and use them as a model to work towards successful restoration.

For example, the objective of building boardwalks in heavily stressed areas of Mystic Vale is one of the chosen options in the restoration of Mystic Vale. It will reduce disturbance my humans and dogs and allow the ecosystem to once again experience natural conditions. Although many positives are linked with building a boardwalk, there could be unseen complications. The article, “Urban Park Restoration and the
‘Museumification’ of Nature”, talks about how boardwalks have taken away from the natural significance of the parks. Explaining that boardwalks and sign usage can create a negative effect with how humans can interact with nature. Although site analysis has called for a boardwalk, after further research both ecologically and socially, it may be seen as an undesired management implementation. This is one example why scientific design is very important in this project.

4.4 Risk Management of Project Design

In every situation dealing with resources, risk has to be accounted for. And so risk management is an important aspect which will be covered in the project design. In this section, the various risks of the objectives will be examined.

**Objective:** Creation of Site Coordinator

**Risk:** Paying money for a Site Coordinator has huge risk implications. For starters, risk of project failure. Invested a large amount of money into one person is quite risky in an ecological restoration project. If the performance by this Employee doesn't produce the expected outcomes there would be huge economic loss for this project. Substantial loss of money through the employment of a Site Coordinator could prevent further restoration in Mystic Vale and the goals of this project would be very hard to achieve.

**Objective:** Boardwalks and Awareness Signs
Risk: Creating a boardwalk in Mystic Vale would cost a substantial amount of money to build. The risk of building a boardwalk in Mystic Vale is the susceptibility of vandalism. With talking to Peter Robert from facilities management, there have been problems in the past with vandalism. This has reduced the amount of money invested into building structures in the Vale. Vandalism is a huge risk in Mystic Vale and was needed to be thought about in this restoration design. Another risk is that the boardwalks and signs may not be as effective as thought. There could be the same amount of disturbance as before and the signs could be overlooked if not placed properly.

Objective: Steering Committee

Risk: Creating a Steering committee is a key concept within this restoration project. But like everything in restoration, there is always risk. Members of the Steering Committee may not agree on restoration ideas and goals. Clashing of values in Mystic Vale may lead to the Steering Committee falling apart. Landowners may not see eye to eye with other members of the committee and as a result the committee may falter and if worse comes to worst, the restoration project could collapse entirely.

Objective: Community Education Program

Risk: Community involvement will be based entirely on volunteers. There is always a risk that there may not be enough volunteers to help with the projects. Because community involvement has a huge part in the implementation stages, objectives of the
restoration project may not succeed. The lack in volunteer numbers could very much so impede the success of restoration project.

4.5 Practicality of Implementations

Although risks are involved with each objective they are still seen as the most fundamentally important for meeting the objectives. Currently, these options have been decided as the best options for restoration in Mystic Vale. If the objectives are implemented properly and managed effectively, they will be huge steps to attaining the goals of restoration. From examining the risk versus ecological success; the success side wins outright. The objectives chosen to build on the goals all have varying levels of risk accompanied with varying levels of success. All have been chosen based on the practicality in their use for restoring Mystic Vale. Meeting with facilities management, Brenda Beckwith (ES faculty member) and Peter Roberts (Facilities Management), these options for restoration have been concluded as being the most practical options for effective, efficient and engaging restoration of Mystic Vale.
5.0 Monitoring and Evaluation

By Karin Campbell

5.1 Introduction

Monitoring and Evaluation are essential to the long term success and maintenance of a restoration project. Data gathered is essential to understanding, planning, and implementing ecological restoration projects and must be archived and easily retrieved. For long term projects like this one, data must be collected using standards and clearly defined data analyses (Parks Canada and The Canadian Parks Council, 2008). There have been many past restoration projects as discussed in section 2.4 and according to Peter Roberts, Facilities Management, some of them were monitored and some were not (Roberts, personal communication, November 2009). Any data collected is presumed to exist within the paperwork of the previous Facilities Manager, or within the Faculty of Environmental Studies. The Coordinator will need to locate this data to start an organized and accessible data base in which all future restoration projects will be recorded. When the data is organized, it can be evaluated if it has not been already, and thus form the basis for a long term plan.

This evaluation plan will be divided into two sections consisting of the monitoring of this specific cultural based project, and of the development of a longer term monitoring plan carried out through the Education Program. The primary method of monitoring will be through questionnaires, mapping and photo point monitoring, the results of which will form a baseline for future evaluations, and to determine whether or not the goals and objectives have been met. Whenever possible the Coordinator should enlist University
students for monitoring plan development, helping to fulfill Objective 17 of the Campus Strategic Plan, *A Vision for the Future-Building on Strength A Strategic Plan for the University of Victoria:* “to increase opportunities for experiential learning and community engagement at UVic” (Planning and Priorities Committee, 2007, pg. 28). This project does not address evaluation plans for the many other issues in Mystic Vale including but not limited to: Hobbs Creek restoration, water quality, runoff issues, tree health, and plant and animal biodiversity. Plans for these will be addressed in the long term planning document.

5.2 Monitoring the Goals and Objectives of this Plan

5.2.1 The Site Coordinator, as explained in Goal One, objective one, is the keystone to this project, and will exist within the Office of Campus Planning and Sustainability at UVic. The Coordinator, being the person who will monitor and evaluate this and all future plans, should monitor their own success by annually reviewing and reporting on the tasks that are outlined in the job description.

5.2.2 The creation of the Steering Committee will also be monitored by the Site Coordinator on an annual basis by reporting on the following questions:

- In the first year: What percentage of stakeholders and users are willing to provide a representative for meetings?
- In the following years: Has the percentage of representation changed?
- Has the Steering Committee been able to meet regularly?
- Once a month for the first year?
• Bi-monthly in the following years?

• Has the Steering Committee been able to come to consensus on major issues?

• Has the Steering Committee been able to provide valuable input to the Coordinator?

5.2.3 The Education Program’s objective is to create programs that provide learning opportunities and to promote stewardship by bring students, classes and community groups into Mystic Vale to perform restoration activities that meet restoration goals. Monitoring in this section will focus on whether or not the programs meet our goals in terms of providing learning opportunities and promoting stewardship. Because this objective is a cultural one, we need to use techniques of evaluation from the social sciences (Aronson, Clewell, Winterhalder, 2004, pg. 11). Whether or not goals are met will be determined through questionnaires. This is an example of a project that the Coordinator could work on with a Social Science class to develop appropriate questionnaires.

Questionnaires will be developed for class/group leaders and program participants that will determine the following questions:

• Did the program fit the time constraint? Were the participants able to complete the tasks?

Figure 5.2.3.1: Teacher and students from Monterey Middle School 2007
• Did the program fit the class curriculum, providing the appropriate experiential learning?

• How many groups per year have participated in an activity?

• How many of these groups are from University classes?

• How many from community groups?

• Has participation in a restoration activity changed how they feel about Mystic Vale?

• Has it changed how they will act in Mystic Vale?

Questionnaires will be passed out at the end of each program and turned in before the participants leave.

5.2.4 Sign Project Part A and Part B implement the installation of interpretive signs to provide more general learning opportunities and stewardship promotion. Monitoring will address whether or not users of Mystic Vale are reading and learning from these signs, as well as monitoring vandalism and the condition of the signs themselves.

To monitor the effectiveness of the signs, Social Science evaluation methods must be again used. The Site Coordinator will arrange to have a volunteer (presumably from the Social Science faculty) to be present in Mystic Vale over a period of time to talk to users and conduct a survey. The survey questions will ask the users specific questions about Mystic Vale based on what information the signs include. As well as questions such as if knowing more about Mystic Vale changes how they feel about it and how they use it. The person doing the survey will also record the number of dogs on leash and off leash.
Monitoring the condition of the signs will be done by assigning a number to each sign and visually inspecting and reporting on the condition of the signs based on the following standardized criteria:

<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No Damage</td>
</tr>
<tr>
<td>1</td>
<td>Slight damage that does not take away from the message</td>
</tr>
<tr>
<td>2</td>
<td>Damage that obscures part of the message</td>
</tr>
<tr>
<td>3</td>
<td>Heavy damage making the sign message void or physical damage that requires replacement</td>
</tr>
<tr>
<td>4</td>
<td>Sign is missing from the site</td>
</tr>
</tbody>
</table>

Table 5.2.4.1: Standardized criteria for sign conditions in Mystic Vale

Monitoring will start 6 months after the signs are installed and take place once in September and once in March after that. To optimize monitoring activities these dates correspond to the dates that Photographs will be taken for the photo point monitoring in section 5.2.5.2 of this plan.

5.2.5 Installation of boardwalks and a platform to meet the goal of reducing human impact and disturbance will be monitored both by visual inspection and by photo point monitoring at key points.

i) Visual inspection of the condition of the boardwalk will be determined by the following criteria:
<table>
<thead>
<tr>
<th>Rank</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No damage</td>
</tr>
<tr>
<td>1</td>
<td>Slight damage</td>
</tr>
<tr>
<td>2</td>
<td>Needs repairs</td>
</tr>
<tr>
<td>3</td>
<td>Needs replacing</td>
</tr>
</tbody>
</table>

*Table 5.2.5.1: Standardized criteria for boardwalk conditions in Mystic Vale*

Human disturbance will be determined by walking the boardwalks and recording:

- the biotic conditions up to and under the boardwalks

- the occurrence of people going off the boardwalks causing damage to the understory

**ii) Photo Point Monitoring** will be done to help monitor the effectiveness of boardwalks and a platform in reducing erosion, and aiding the recovery of ground cover and understory plants. Photos should be taken every six months, in March and in September, before the leaves fall obscuring the ground to best show what plants survived the winter and the dry summer. For the purpose of this project, photos were taken at four key points (Figures 5.2.5.1 and 5.2.5.2), recording camera location, angles, and settings as listed beside each photograph to provide baseline photos of the area, but a much more scientific protocol should be followed as found in the USDA Forest Service, *Photo point monitoring handbook* (Hall, 2002). Photographs were taken on Manual mode with a 35mm digital camera, with a 20 mm lens. F 2.8, ISO 200.
Figure 5.2.5.1: Representation of Mystic Vale, K. Campbell 2009

<table>
<thead>
<tr>
<th>Photo number</th>
<th>Location and view</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Taken on the E staircase, 12 steps from bottom. Facing NW. Camera was set on the railing. Leaning tree in the foreground was aligned in the lower R. Corner of field of view. Camera was angled down until the top of the N. Staircase was aligned with the top of the photo.</td>
</tr>
<tr>
<td>2</td>
<td>Taken at the centre post on the bridge facing NE. Camera was set on the railing and the stump was aligned in the centre of the field of view.</td>
</tr>
<tr>
<td>3</td>
<td>Taken at the centre post of the bridge facing SW. Camera was set on the railing.</td>
</tr>
<tr>
<td>4</td>
<td>Taken on the N staircase, 10 steps from bottom at the first landing. Camera was set on the L. Hand rail and RH rail was aligned to the lower R of the field of view and angled SW until the end of the railing hit the LH field of view.</td>
</tr>
</tbody>
</table>

Figure 5.2.5.2: Photo Point monitoring sites. Mystic Vale
iii) Installation of hedges to meet the goal of reducing human impact and directing foot traffic will include monitoring the survival of the plants as well as the cultural impact. The hedge project will follow an adaptive management approach as defined by *Ecological Restoration Principle and Guidelines* (Parks Canada and The Canadian Parks Council, 2008, pg.61) which projects are implemented as deliberately conceived experiments and results are monitored and reported on to guide future actions. Assuming that the hedges should be planted in September and October, they should be inspected the following spring for survival rates. The planting and monitoring of these hedges provides opportunities for the Coordinator to work with University classes to set up measured experiments in snowberry hedges. For example an experiment could be executed to see if heavy mulching of the soil around the young plants in the damp spring is enough to keep them alive over the summer or if they need to be watered and how much. These experiments should be done first before investing in extensive plantings. Once established hedges should be inspected on a yearly basis and assessed as to if they need to be trimmed to increase density or to reduce height.

To monitor if the hedges reduce human impact, visual inspections will be conducted once a year, to determine if they have been effective in directing traffic by checking to see if there are holes made in the hedge and rough trails formed where people have gone beyond them. Photo Point monitoring will also be done once a year in the key spots, see adjacent figure which shows where disturbance has had the most impact in the past such as

*Figure 5.2.5.3: Soil erosion at the bottom of the north stairway Mystic Vale*
at the top and bottom of the North stairway. The photographs will provide valuable long
term information about the changes that the hedges are making.

5.3 **Long term monitoring of Mystic Vale through Education Programs**

The Educational Program, developed by the Coordinator, to carry out long term
monitoring of Mystic Vale will incorporate the idea of Focal Restoration; rebuilding our
concern with things that matter and “build value through participation, and in doing so,
strengthen human communities” (Higgs, 2003, pg. 226). Plans will be developed that will
increase awareness, participation, and cooperation especially from UVic students and the
dog walking community, to encourage stewardship and to reduce the incidence of
vandalism and human disturbance. Also, to reduce the amount of English ivy and increase
the number of native ground covers while at the same time gathering information to
successfully monitor and evaluate, and provide prescriptive remediation to the site. To
accomplish this, the plans must be small, highly organized and fit into the time schedule of
classes. The following steps must be taken to follow through with this idea:

- Division of Mystic Vale into workable plots using parameters that are work centric
  (rather than even geographic divisions) (D. Campbell, personal communication,
  November 24, 2009). Identifying the geographic coordinates in a data base for future
  field navigation (staking out the plot), and identifying plot boundaries on a map so plots
  can be more easily identified in the future (this would be a great project for GIS
  students). Plots will be numbered and a systematic plan developed to minimize damage
  from increased foot traffic.

- Development of complete restoration plans for each plot, addressing its particular
  needs, and choosing native plants from Appendix B.
• Adaptations of plans with varying completion times to fit time constraints of classes and community groups. Examples: ES341 is an hour and a half, Grade 6 field trips, 4 hours.

• Development of a standardized monitoring system.

• Development of a standardized mapping system to monitor natural features and biota.

• Development of a standardized photo point monitoring program.

• A standardized method of compiling data.

This is a huge amount of initial work but in completion will provide work experience for university classes and will make it possible for seemingly spontaneous restoration projects to happen, and fit within the larger restoration goals and objectives of the long term restoration plan. Even though each project is quite small, they will systematically chip away at the removal of English Ivy and other invasive plants, replacing those with native plants to increase biodiversity and protect the soil from erosion. Before too many years have passed every plot will have been monitored and remedial measures taken and the cycle through the plots can start again. Appendix C has an outline of a sample program adapted to a Grade 6 field trip.

5.4 Evaluation

Evaluation of the data collected will be done by the Site Coordinator in consultation with professionals and will be used to create remedial plans and be the guide for the development of further restoration projects. In order for it to be accessible in the long term, the Ecological Restoration Principles and Guidelines in Canada’s Protected Natural Areas prescribe that data must be managed through using a record management (archival) system and issues such as intellectual property rights, data sharing agreements and access restrictions must be addressed (Parks Canada and the Canadian Parks Council, 2008,
According to Doug Campbell, president of Range and Bearing Environmental Mapping Corporation, a project management system such as “Redmine” (www.redmine.org) would also be helpful in keeping data organized and in arranging for remedial plans (Personal communication, November 24, 2009)

5.5 Reporting

It will be the job of the Site Coordinator to report on the evaluation of this and future restoration plans to applicable people. A quote from the Ecological Restoration Principles and Guidelines in Canada’s Protected Natural Areas, Parks Canada and the Canadian Parks Council, (2008) clearly illustrates the importance of reporting:

Communication of results and lessons learned to stakeholders, colleagues, the public, and policy-makers...is an important component of project implementation. Successes should be celebrated and broadly publicized. Communication to the public contributes to a broader understanding of the concept of ecological restoration and builds public support. Communication amongst restoration practitioners contributes to the larger body of knowledge that leads to advances in this field and the development of evidence-based conservation in general (Sutherland et al. 2004). Communicating results to policy-makers and decision makers helps ensure ongoing support and funding and is particularly important in ensuring the long-term funding needs of complex projects that may require ongoing maintenance and intervention are met (p. 66).
6.0 Conclusion

By Karin Campbell

Our project focuses on incorporating boardwalks, hedges, signs, and a meeting spot by the pool to embrace the cultural use of Mystic Vale while at the same time protecting and restoring the biotic community and the abiotic structures. It will provide educational opportunities that will expand on classroom learning and foster a stronger bond with nature and a better understanding about our human impacts on natural systems. At the same time, it will provide a constant volunteer labour force to carry out restoration plans, specifically to chip systematically away at the English Ivy. It will provide an overarching organizational structure to ensure continuity in restoration activities and a link between all parties involved in Mystic Vale. The SER International Primer (2004) states:

Cost savings can be realized by careful coordination of restoration activities with other aspects of a large program. For this reason, project managers will benefit by recognizing ecological restoration as an integral component of a program. If this is done, the restorationist can contribute substantively to all aspects of the program that impinge on restoration. Moreover, the restorationist will be in a position to ensure that all ecological restoration is well conceived and fully realized. In this manner, the public good is served (pg. 13).

It is our firm belief that Mystic Vale needs to move from band-aid solutions to this solution of organization involving a Site (Natural Areas) Coordinator and a Steering Committee of stakeholders. Our restoration plan will get to the root of the problems in Mystic Vale, making it a well managed natural area that is well loved and admired by those who use it now and in the future.
References


Concept Plan from the 2003 Campus Plan showing Lower Hobbs Creek, Mystic Vale as a protected in perpetuity and the Upper Hobbs Creek section protected with a 10 year moratorium.
Appendix B

Native Plants of Mystic Vale (Turner 1993)
from the University of Victoria Natural Features Study (2007)

NATIVE PLANTS OF MYSTIC VALE, SAANICH, BRITISH COLUMBIA
Nancy J. Turner and Brett Henke
Environmental Studies Program
University of Victoria

List of Plant Species from Brief Survey of rim, slopes and creekside areas of Mystic Vale. - Please note that many herbaceous perennials and annual plant species are not visible at this time of year. (Species listed alphabetically by scientific name within major categories of TREES, SHRUBS, HERBACEOUS FLOWERING PLANTS, FERNS AND FERN-ALLIES, MOSSES AND LIVERWORTS. A note on LICHENS and FUNGI is also made.

TREES
Grand fir (Abies grandis)
Broadleaf maple (Acer macrophyllum)
Red alder (Alnus rubra)
Arbutus (Arbutus menziesii)
Black cottonwood (Populus balsamifera ssp. trichocarpa)
Bitter cherry (Prunus emarginata)
Douglas-fir (Pseudotsuga menziesii)
Cascara (Rhamnus purshiana)
Hooker’s willow (Salix hookeriana)
Scouler’s willow (Salix scoulerianna)
Sitka willow (Salix sitchensis)
Western red-cedar (Thuja plicata)
Pacific yew (Taxus brevifolia)

SHRUBS
Saskatoon berry (Amelanchier alnifolia)
Red-osier dogwood (Cornus stolonifera; syn. Cornus sericea)
Salal (Gaultheria shallon)
Oceanspray (Holodiscus discolor)
Orange-flowered honeysuckle (Lonicera ciliosa)
Hairy honeysuckle (Lonicera hispida)
Tall Oregon-grape (Mahonia aquifolium; syn. Berberis aquifolium)
Common Oregon-grape (Mahonia nervosa; syn. Berberis nervosa)
Indian-plum (Oemleria cerasiformis)
False box (Pachistima myrsinites)
Mock-orange (Philadelphus lewisii)
stink currant (Ribes bracteosum)
black gooseberry (Ribes divaricatum)
Red-flowering currant (Ribes sanguineum)
Dwarf wild rose (Rosa gymnocarpa)
Nootka rose (*Rosa nutkana*)
Thimbleberry (*Rubus parviflorus*)
Salmonberry (*Rubus spectabilis*)
Trailing wild blackberry (*Rubus ursinus*)
Red elderberry (*Sambucus racemosa*)
Snowberry, or waxberry (*Symphoricarpos albus*)
Red huckleberry (*Vaccinium parvifolium*)

**HERBCEOUS FLOWERING PLANTS**
Vanilla-leaf (*Achlys triphylla*)
Sedge (*Carex spp.*)
Coralroot (*Corallorhiza maculata*)
Sweet-scented bedstraw (*Galium triflorum*)
Large-leaved avens (*Geum macrophyllum*)
Rattlesnake plantain orchid (*Goodyera oblongifolia*)
#Purple pea (*Lathyrus nevadensis*)
Twinflower (*Linnaea borealis*)
Wood-rush (*Luzula sp.*)
Skunk-cabbage (*Lysichitum americanum*)
Indian pipe (*Monotropa uniflora*)
#Siberian miner's-lettuce (*Montia sibirica*)
Nemophila (*Nemophila parviflora*)
Water-parsley (*Oenanthe sarmentosa*)
#Sweet cicely (*Osmorhiza ? purpurea*)
Sanicle (*Sanicula crassicaulis*)
Yerba buena (*Satureja douglasii*)
#False Solomon's-seal (*Smilacina racemosa*)
Hedge-nettle (*Stachys cooleyae*)
#Common twisted-stalk (*Streptopus amplexifolius*)
Tall fringecup (*Tellima grandiflora*)
Fringecup (*Tiarella trifoliata*)
Starflower (*Trientalis latifolia*)
Western trillium (*Trillium ovatum*)
Stinging nettle (*Urtica dioica*)

(NOTE: a number of grass species were also observed, but not identified)
# additional species from May, 1993

**FERNS AND FERN-ALLIES**
Lady fern (*Athyrium filix-femina*)
Spiny wood fern (*Dryopteris expansa*)
Common horsetail (*Equisetum arvense*)
Branchless horsetail (*Equisetum hiemale*)
Giant horsetail (*Equisetum telmateia*)
Licorice fern (*Polypodium glycyrrhiza*)
Sword fern (*Polystichum munitum*)
(NOTE: Mystic Vale contains one of the most spectacular populations of sword fern anywhere on southern Vancouver Island)

Bracken fern (*Pteridium aquilinum*)

**SOME MOSSES AND LIVERWORTS**

(NOTE: This list is very incomplete, representing only a fraction of the species occurring in the Vale)

- Antitrichia moss (*Antitrichia curtipendula* )
- Fork moss (*Dicranum scoparium* )
- Hypnum moss (*Hypnum circinale* )
- Stolon moss (*Isothecium myosuroides* ; syn. *I. stoloniferum*, *I. spiculiferum*)
- Oregon feather moss (*Kindbergia oregana* ; syn. *Eurhynchium oreganum* )
- Feather moss (*Kindbergia praelonga* ; syn. *Eurhynchium praelongum* )
- Palm-tree moss (*Leucopelis menziesii* )
- Douglas neckera moss (*Neckera douglasii* )
- Neckera moss (*Metaneckera menziesii* )
- Mnium moss (*Plagiomnium insigne* )
- Plagiothecium moss (*Plagiothecium undulatum* )
- Leafy liverwort (*Porella navicularis* )
- Mnium moss (*Rhizomnium glabrescens* )
- Feather moss (*Rhytidiadelphus loreus* )
- Triangle-leaved feather moss (*Rhytidiadelphus triquetrus* )
- Leafy liverwort (*Scapania bolanderi* )

**NOTE ON LICHENS and FUNGI**

A complete inventory of Mosses, Liverworts, Lichens and Fungi in the Mystic Vale area should be made. A few identifiable lichens seen include: *Ochrolechia* sp.; *Cladonia* spp.; *Cetraria* spp.; *Platismatia glauca*; *Parmelia sulcata*; *Hypogymnia physodes*; *Peltigera* sp.; *Usnea hirta*. A wide variety of fungi, including mushrooms and tree fungi, also occur in the area, contributing to the overall biodiversity.

**BIRDS**

NOTE: It is particularly important to survey this area on a year-round basis, not just over a short period, because the woods of Mystic Vale and surrounding areas may provide critical habitat not just for resident bird species, like winter wren and rufous-sided towhee, but also for migratory species, which need these areas for resting and feeding on their northward and southward journeys. Woodpeckers abound in the vale, as do a wide variety of small songbirds--kinglets, bush tits, juncos, creepers, wrens. Owls, eagles and other raptors need the tall trees and snags for nesting and perching.
Appendix C
By Karin Campbell

Outline of an education program aimed at Grade 6 students that ties in with a watershed program currently being offered to Grade 6 students in the CRD.
Karin Campbell, 2009

Classroom portion. 1 hour
Discussions on what, how, why we restore, how the damage was done, a little tantalizing history of the site, pictures or examples of invasive plants and native plants or other hands-on goodies. Instructions on how to map, instructions on how to plant, and how to mulch, and the importance of mulching. 4 Groups formed, keeping in mind ability levels, and assigned jobs so that on the day of the field trip there is no time wasted doing this.
Job list:
- Mapping
- Bringing mulch to the site
- Bringing plants to the site
- Documenting: Photo point monitoring, photo journal, filming.

Outline of the day, what is expected, take home list of what you need to bring: take-in-take out message. Take home permission and waiver forms.

Onsite Activity. 4 hours
Welcome at the platform, Rules (illustration 2) Overview, review of the jobs.
Divide into the 4 job groups.
- Group 1, Mapping. Using the map provided (standardized for monitoring purposes) map the plot putting in the current native plants (need to name them and books will be available) as well as any interesting features like wildlife trees, bird nests etc.
- Group 2, carrying plants to the plot site from the parking lot.
• Group 3, carrying mulch to the plot site from the parking lot.
• Group 4, Take photographs at photo point locations, photo/video document activities and interesting features, photos for an online photo journal that all will have access to later. (this is their take home prize that can be shared with family and friends)

Break
Finish up jobs
Everyone pulls English Ivy
Lunch- Freedom to explore Mystic Vale on the paths and out of the stream (remind them it has pollutants in it and they won’t touch it)
Everyone plants native plants and mulches around their plant

Break
Groups 1 and 2 hauls Ivy to the parking lot.
Groups 2 and 3 adds the new plants to the map.
Conclusion- Wrap up, fill out and turn in questionnaires forms.

Figure 2: Ariolimax columbianus

Rules: All the safety and respect rules from school.
Stay on the paths unless you are working directly in your plot.
No hacking at plants with sticks or other tools.
No intentional eroding of the soil.

Consequences: Lick a banana slug! (just a joke of course, but will be effective for Grade 6 kids) “Yes you may at the end if you have perfect behaviour today!”