

**Restoration Through Recreation**  
**Proposal for a Backcountry Campsite and Outdoor  
Recreational Activities**

**University of Victoria**  
**ES/ER 441 Design Project ~~Rough Draft~~**  
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## **Introduction**

In pursuit of creating recreational and educational programs and opportunities at the Learning Centre, the Galiano Conservancy Association (GCA) has expressed the need to expand their capacity to host visitors and learners. Their existing capacity includes one walk-in style campground with 18 tent sites, located within 200 metres of the GCA's learning centre and main site amenities. However, the GCA is attempting to expand and encourage more recreational opportunities on their site. Thus, this proposal envisions space for a backcountry campsite that will allow groups to have a unique and authentic experience during their stay at the Learning Centre.

A backcountry campsite is defined as a more isolated experience, "practiced in the wilderness...with little in the way of amenities (Parks Canada, 2014) and strives to "localize the impact of camping" (Sites and Trails BC). Walk or drive-in tent sites are more easily accessible and provide closely located amenities, and are usually larger to facilitate a greater amount of equipment or individuals (Parks Canada, 2014). For the purpose of this project, we will be focusing on the construction of a backcountry campground that also has closely located amenities, such as a bathroom and an above ground fire pit, to add comfort to groups' visits. This site will also act as a hub for outdoor recreational and educational opportunities, and so the design of a low impact ropes course as well as a Learning Site have also been proposed. The ropes course will merge nature-based learning and team-building skills, while the Learning Site represents a place to contemplate and reflect, by the comfort of a fire or eating at one of the covered picnic tables.

The vision of this proposal remains compatible with the existing goals and objectives developed by the GCA, which "focus on what to protect, then on what to use" (GCA Management Plan, 2013, p.4) This proposal places heavy emphasis on restoring the impacted site in order to move forward with the recreational and educational goals. This will be achieved through the maintenance of invasive species and the re-introduction of native vegetation and a more significant understory to provide more privacy for the campsite. From here, we envision a space for nature based learning and sustainable recreation experiences through ongoing educational and restoration practices.

According to Phan (2011, as cited in Haras, Bunting and Witt (2006)), "structured recreation programs create positive change when they provide challenging activities which

demand effort and concentration”. If the recreational component of this proposal can offer a space for groups to be challenged, both physically and mentally while in nature, we believe that this will have a lasting effect on visitors to strive to be environmental stewards. In the GCA’s management plan, the opportunity for recreational activities “are an important component of providing an enjoyable, healthy visitor experience to the Learning Centre” (2013, p.34). Furthermore, the GCA notes that these activities can provide opportunity to encourage team building, self-growth and general fun. Phan (as cited in Haras, Bunting and Witt (2006)) argues that the outcomes of outdoor recreation include an increase in teamwork skills, communication, trust, self awareness and management skills.

The purpose of this project is to create resources for the GCA to use in future recreation and education planning. The following goal and design proposal encourages best designs and practices that will fulfill the vision we have created for a unique outdoor recreational experience.

## **Background**

Before construction of the campground and outdoor recreational activities can ensue, hearty restoration efforts must first occur. The proposed backcountry camping and outdoor recreational site has been under- maintained, allowing for a hyper-abundance of Stinging Nettle (*Urtica dioica*) and invasive species, such as Bull Thistle (*Cirsium vulgare*) and Orchard Grass (*Dactylis glomerata*).

The proposed backcountry and recreational site was selectively logged, therefore evident new tree growth and patchy areas with multiple stumps are common throughout the site. The site sits at an approximate 10-15 degree Southwest slope, which makes design challenging. The site requires extensive restoration through the pulling of invasive species, pruning of native Salal brush, and maintenance of non-native grasses that dominate much of the surface area of the site. We would like to work with the Conservancy to establish a safe space that will engage visitors in the education of such restoration efforts, while also recognizing the amount of work required to be completed before the construction of recreational opportunities and amenities can occur. Once completed, the campground will act as a pivotal space in fostering a unique educational experience for school-age and adult groups seeking to learn about their natural environment.

This proposal would also like to acknowledge that, in the pursuit of construction, working with disturbed land rather than creating new disturbances is highly valued. As reflected in the GCA's management plan (2013, p.4), "activities on the land should bring us closer to natural processes, to ourselves and to one another". Applying this mantra to our proposal will bring us closer to understanding the natural and anthropogenic- influenced processes that take place in order to provide recreational and educational space for individuals of any age; something that is both overwhelming and humbling.

The goals and objectives below have been carefully crafted to work alongside the GCA's mantra, in a least invasive way as possible to achieve our vision.

## **Goals and objectives**

### Restoration

**Goal A** - Remove invasive plant species and replace with native brush and tree species to restore the campground and surrounding trails.

*Objective 1-* Remove approximately 30-50% of invasive grasses using a weed-whacker, remove up to 80% of Bull Thistle (*Cirsium vulgare*) clusters using a shovel, and remove 90-100% of Stinging Nettle (*Urtica dioica*) by hand or using a shovel (Kind County). These are the 3 most common problem species, Bull Thistle and grasses being invasive, and these techniques are the most suitable for removal and limiting seed spreading and regeneration.

*Objective 2-* Plant at least 4 different shrub species and 2 different tree species that are low maintenance and suitable to grow in the designated area. This will further enhance the backcountry composition to the site and allow plant diversity to flourish.

### Campsite Design

**Goal A-** Propose a low impact backcountry campground design plan for the Galiano Conservancy Association that facilitates nature based learning and leave-no-trace camping practices.

*Objective A1* - Create a map of low impact camping amenities, including outhouses, tent plots, recreation area, and learning space for 20-25 people.

*Objective A2*- Map and describe an appropriate site access and movement design that includes an emergency access road and comprehensive trail networks.

#### Recreational goals and objectives

**Goal A** - Establish a self-directed, low-impact, ropes course suitable for a range of ages

*Objective A1* - Propose best locations on a map within the campground site for low ropes course that will ensure the safety of users.

*Objective A2* - Design a course that is unique and low-impact (uses locally sourced material and does not pose a threat to surrounding vegetation), and is engaging for all ages- school aged and adult groups.

#### Educational Goals and Objectives

**Goal A** - Create simple educational interpretive signs on campground and recreation site

*Objective A1* - Use at least 50% recycled material to develop a simple sign that informs hikers and groups of the history of the site and any native plants will be discovered during site visits (similar to the existing sign at the mill site, see figure 19)

*Objective A2* - Include simple and easy to read signs along the ropes course for users

### **Design Concept**

The goals and objectives outlined above create the foundation for the design component. Firstly, the restoration objectives will help to achieve a safe space for users to camp and move around, while also learning about and enjoying the native vegetation found on Galiano Island. The objectives communicated to guide the construction of the backcountry campground will help to build a comfortable and rustic experience to suit the needs of all visiting groups. Finally, the recreation and education objectives will achieve the creation of a unique and connecting outdoor experience, emphasizing group and community cohesion and environmental education.

Below is a descriptive analysis of each design component of the proposal.

## **Restoration Design**

### Considerations

The site where the backcountry campsite will be situated is an open, mixed Douglas Fir (*Pseudotsuga menziesii*) forest comprised of moist to dry soils with some areas on a slight south-east slope. The land is currently dominated by European and Eurasian invasive grasses, assumed to be Orchard Grass (*Dactylis glomerata*), and thickets of invasive Bull Thistle (*Cirsium vulgare*) cumulate around grassy areas. The backcountry restoration design proposed to the GCA is the starting point to developing a backcountry camping and recreation area that is intended to increase the capacity of the Learning Center and facilitate multiple groups engaging with nature based learning.

Managing invasive plants, removing Stinging Nettle (*Urtica dioica*), clearing woody debris, establishing trails, and finally planting a variety of native species are all important components necessary to restore the site. Species removal and management is designed to make room for a learning space, tent plots, and allow native species to thrive in optimal conditions while remaining a simple and approachable task. Completely removing all invasive species from the site is a daunting task that is unlikely to be successful thus, routine management is key in keeping European grasses and bull thistle from dominating the site; refer to appendix B for appropriate practices in removing invasive species. Removal should be concentrated in the areas with highest use, specifically the tenting areas, low ropes course, learning space, and trail networks. Invasive species are difficult to remove due to their tolerance of a wide range of conditions, including disturbed sites and variable amounts of sun, shade, and moisture (king country). Using a weed-whacker or mower is the most efficient option for maintaining the invasive grass population. Agronomic European and Eurasian grasses colonize open or disturbed areas rapidly, produce vast quantities of seeds, and outcompete native species for space, water, and nutrients (Canadian Parks and Wilderness Society). Bull thistle can be more readily removed than invasive grasses, using thick gloves and removing the roots with a shovel (king country). A map of target areas for species removal is not included in this document due to the complex nature of the removal process. Bull Thistle is spread in various thickets and grasses cover much

of the surface area of the site, in addition large woody debris is spread throughout the site and is difficult to accurate map which mounds should be moved.

Figure 1, below, maps the areas within the site that require restoration. In all polygons, save for the oval shape, we strongly encourage tree planting to thicken the existing tree line and establish a more significant understory. Doing so will not only increase the biodiversity and available foraging and nesting habitat of the area, but also contribute to an authentic, private and enclosed backcountry feel.

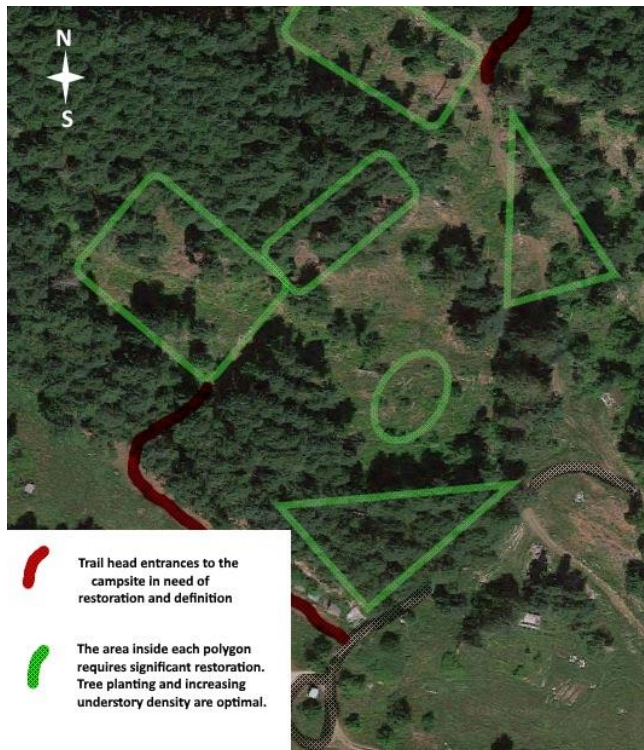


Figure 1. This map denotes the areas that require restoration in green polygons and trails that need restoration/establishment in red. Areas dominated by invasive species are not shown here due to the sparse nature of their establishment.

There are a variety of plant species that would be suitable to grow in this location, a combination of 11 trees, shrubs, and berry plants that are low maintenance and compatible with the conditions present at the site are described in more detail in appendix B. In order to keep the design project local and sustainable, this design aims to select as many planting species as possible from the GCA's plant nursery. Based on the GCA plant nursery 2016 inventory, over 80% of the species selected for the restoration process can be purchased locally. Planting 2 or more different types of trees, 2 or more types of shrubs, and 3 or more types of berries will



facilitate and increase in biodiversity within the site; these numbers are based on judgement of the site's existing species and conditions and can easily be manipulated to better the restoration process. The focus on native berry species is a great way to facilitate and contribute to nature based learning through enjoyable and rewarding species identification. Increasing the variety of native species, reducing invasive species, and enhancing the vegetation composition of the land will further augment the backcountry structure of the site.

## Planting

The planting design proposed in Figure 2 is simplistic and intuitive and is designed such that the GCA can select the species and planting regime that is most appropriate for their existing goals around the backcountry campsite. The map provides a basic outline, demonstrating what sections of the site require attention and what species are most suitable for these sections.



Figure 2. Areas within the site that require planting. The legend briefly describes what species are appropriate for each highlighted polygon.

The planting regime for this site should follow similar trajectories of existing restoration projects at the Learning Center. It is extremely important to monitor sapling growth and survival and to enclose new saplings in early stages of growth with durable fencing to prevent deer browsing.

The grey oval, shown in Figure 2, is a natural depression in the landscape. This spot receives intermittent sun and the soils appear sufficiently moist to support various berry shrubs. At this location, planting taller berry bushes in the center of the oval and rotating outwards with smaller shrubs and berries appears to be the most effective design. Native berry species have been selected for this location because it is close to the tenting area, some taller bushes may increase the enclosed nature of the tenting sites, and visitors can enjoy the delicious fruit. Along the tree line, green polygons in Figure 2, establishing a more robust forest density and increasing the understory is the main goal. Planting a variety of trees and shrubs including, Douglas Fir (*Pseudotsuga menziesii*), Western yew (*Taxus brevifolia*), Dull Oregon Grape (*Mahonia nervosa*), Sword fern (*Polystichum munitum*), and Salal (*Gaultheria shallon*) is optimal at this location. The red polygons shown in figure 2 are the driest areas of the site that receive the most sun. This area is best suited for supporting Arbutus (*Arbutus Menziesii*) and shrubs that tolerate dryer, sunny locations (see Appendix B). The blue polygon is the site proposed for the recreation and low ropes area. Here there is a mix of sun and shade, as well as moist to dry soils, thus this region can host numerous native species including Orange Honey Suckle (*Lonicera ciliosa*). The GCA should select as many planting species as possible from the GCA plant nursery and follow a simplistic and achievable restoration design.

## **Campground Design**

Backcountry camping, sometimes referred to as “primitive” (Parks Canada, 2014) is designed to be “isolated, undeveloped, remote and difficult to access” (trails website, n.d.). This particular backcountry campground design will incorporate a remote and rustic experience, while still providing necessary amenities to comfort users of the space. As stated earlier, the campground will include a learning site to facilitate larger groups and provide shelter from the unpredictable climate, an outhouse, and tent sites large enough to host a group of 30-40 individuals. Through restoration efforts of replanting and filling in vegetation, this will achieve a

more isolated impression within the campground, which will create a space to expand nature based learning and help users develop a personal connection to the physical surroundings.

Backcountry campgrounds “are designed to localize the impact of camping...” (Sites and Trails BC, p. 52) but we recognize that some human influence will occur. The sites are designed to be easily accessible to discourage users from trampling on the surrounding vegetation. Also, the design encompasses the use of directly local sourced materials, suggested by Sites and Trails BC (p.34), “clearing and road construction phases should recognize and preserve usable building materials.” These building materials may be used for the construction of the learning site or the low ropes course within the campground area.

The restoration practices described in the previous section open up the site to safe and enjoyable camping by groups of all ages. Removing Bull Thistle, Stinging Nettle, and thickening the tree line and understory density help to facilitate the rustic backcountry camping experience. The proposed design encourages the use of at least 50% locally sourced, recycled, and sustainable building materials in order to encourage low impact building practices. In this design proposal, we will associate closely with the management plan presented by the City of Rocks National Reserve in Idaho, United States, as a guide for best practices. Although this backcountry site is located in a completely different region than Galiano Island, we found this particular design to most closely reflect the vision for the GCA backcountry campground. This particular National Reserve states that ‘although much of the function of new construction would be to support recreational uses, every attempt should be made to use design that is as uncomplicated and as unassuming as the present character’ (City of Rocks Management Plan, p.342). In this proposal, multiple options between low and moderate impact will be presented, such that the GCA can select the most appropriate design and maintenance regime for their existing goals and visions.

### Trails

Foot access to the backcountry campsite involves 2 points of entry, with one trail on the North-North-East side of the site and the second on the South-South-West side of the site. The site design proposed here will ‘contain all the features of a developed campsite, but access to sites would be by foot [...] this concept is an attempt to preserve as much of the overstory

vegetation as possible for campsite uses' and prevent creating additional disturbance through constructing and expanding road networks (City of Rocks Management Plan, p. 343).

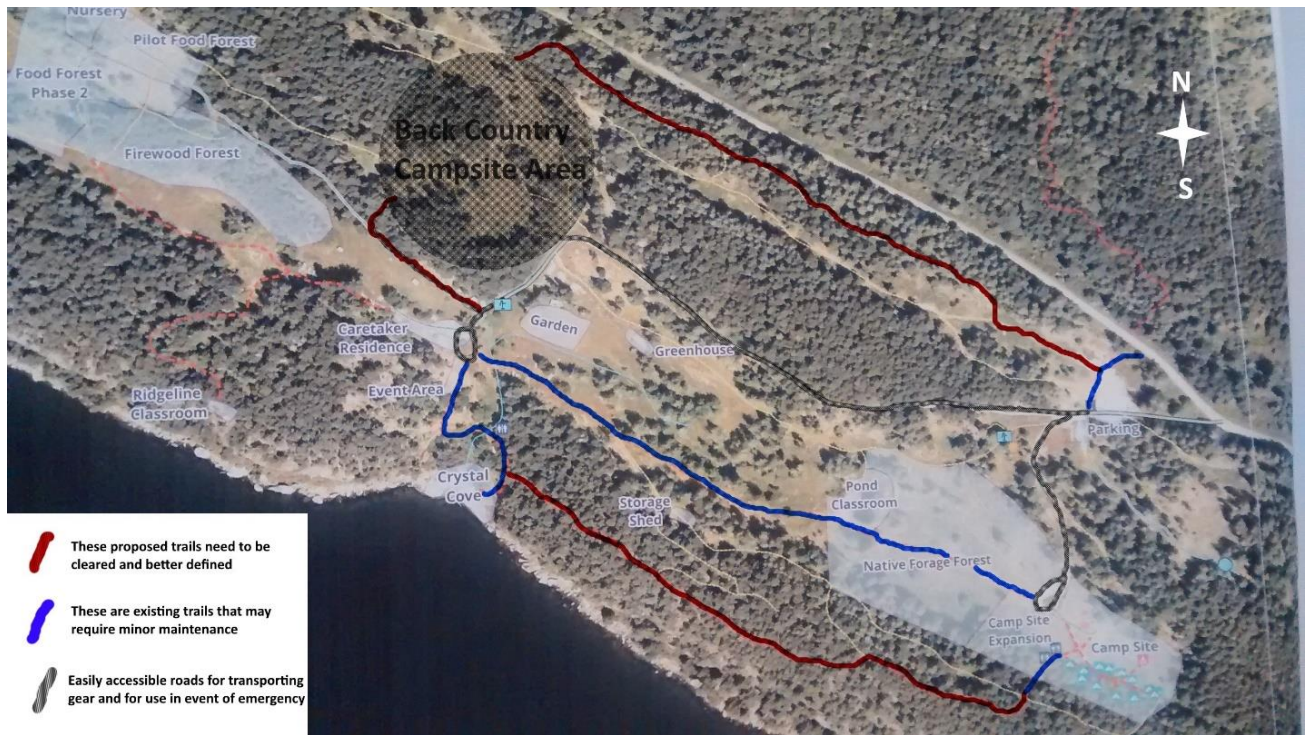


Figure 3: The map above denotes potential trail networks that provide access to the proposed backcountry campsite.

Figure 3, shown above, takes advantage of existing trail networks on the Conservancy's Lot 57. Trails highlighted in blue are already well established and used frequently by groups occupying the Learning Center. Although used frequently, these trails still require minimal maintenance through removal of Stinging Nettle and Bull Thistle. During our group's visit to the site in early July 2016, the blue trails were easily accessible and well maintained, however, some Stinging Nettle and Bull Thistle is beginning to re-establish along the edges of the trail. The trails in blue provide quick access to the Learning Center facilities, as well as the Crystal Cove swimming hole.

Trails highlighted in red, also shown in figure 3, are a combined network of broken trails and overgrown logging roads. These trails are currently less accessible and require significant management to define a clear path to the backcountry campsite. In establishing these trails, re-purposing old, overgrown trails and logging roads should be emphasized to keep human impact

on the sensitive ecosystem at a minimum. Part of the 'backcountry experience' is hiking on foot to the campground, and the trails highlighted in red are excellent to facilitate this method of transport. It should be noted, the North-North-East entrance trail, near Porlier Pass Rd., is less defined than the southern trail that travels along the water's edge. The North-North-East trail runs parallel to a well-used dirt logging road and will require greater maintenance than the South-South-Western trail due to greater abundance of Stinging Nettle, invasive grasses, and Bull Thistle.

Both the blue and red trails require Bull Thistle and Stinging Nettle pulls, which should focus on the edges of the trail, approximately 0.1-0.3 meters on either side depending on the foliage density. If greater accessibility is required for groups with limited mobility, weed-whacking the abundance of tall invasive grasses along the sides and in the center of the trails can improve ease of access to the backcountry campsite.

Our group proposes that emergency road access to the backcountry campsite is necessary to ensure the safety of all campers in the event of emergency. In figure 3, the grey markings are well used dirt roads, one of which runs parallel to the South-East side of the site. Currently, the road can be seen from the campsite. Through the restoration practices previously described, thickening the tree line and increasing the understory density will hide the road from sight to increase the enclosed feeling of backcountry camping. The restoration regime will leave a small, vehicle-sized opening in the tree line to provide emergency access to the road. This opening cannot be seen from the tenting area but will be slightly visible from the proposed learning site, described below. The area of the site reserved for emergency access is on a slight slope, unfitting for tent sites or a learning space, thus making the location appropriate.



Figure 4: The map above denotes a simple representation of the proposed site design plan.

### Tent Area

As requested by the Galiano Conservancy Association, the backcountry campsite should have the capacity to facilitate anywhere from 20-25 adults and children. The proposed location for the tent plots begin on an old, overgrown logging road, shown in green in figure 4. Using this area will help re-enforce the proposed design goal, in creating as small a human impact on the land as possible through re-purposing previously disturbed land. The logging road is approximately 35-40 meters long and approximately 8 meters wide. An additional stretch of land, approximately 20-25 meters long and 8-10 meters wide running along the South-South-East portion of the site creates an L-shape tenting area. According to Sites and Trails BC (p.52), “backcountry facilities are much smaller than motorized access campsites; usually 6 units, as opposed to 15 or more units”, and the distance between individual campsites “should be separated by a minimum of 30 metres...and be approximately 8 metres in diameter... to maintain privacy and a backcountry experience”. Although the design is endorsing a “backcountry experience”, the purpose of this proposal is to design a space large enough to host visiting groups. With this consideration in mind, we believe that the sites be constructed smaller and

closer together to fit within the proposed campground site. The site itself spans approximately 40 meters in total length. Therefore, we recommend the size of tent plots be 3x5 metres, and approximately 5 meters apart. Given these measurements, the area shown in green on figure 4, has the capacity to host approximately 5 tent plots, 2 across the South-South-East short portion and 3 along the South-South-West longer portion. With the assumption that group members will be sharing tent space, this portion may have the capacity to hold up to 10 adults in double tents, or 15 children sharing three per tent. The short meter portion of the proposed tenting site begins to slope South-West approximately 15 degrees nearer the emergency road access. The last 2 or 3 tent plots in this area may require some terracing to level out the land.

The forested area South-South-West of the green polygon, shown in figure 4, is relatively flat and well spread out, thus additional plots can be developed in a similar manner to the adjacent site. Following our proposed dimensions, we estimate the creation of an additional 4-6 tent sites in this area (actual dimensions need to be determined for best practices). To keep impact on the landscape minimal, we do not recommend removing trees to accommodate additional tenting sites. In figure 4, an additional purple polygon shows a potential extension to the tenting site. There is a slight slope to this area, thus may require terracing similar to the end of the L-shaped portion. With all tent site extensions developed, the area has the capacity to facilitate 9-11 tent plots.

The degree of tent site maintenance required for basic upkeep will depend on the designs selected for defining each plot. We recommend the tent plots located in the green polygon, shown in figure 4, be defined in a manner similar to the tent site at the Learning Center, where mulch is laid and enclosed by small logs. To continue enforcing the low impact regime described in Goal A, we recommend using logs and woody debris collected from the site; there are numerous slash pile deposits on the site from previous logging regimes. For the tent sites located in the forested area South-South-West of the logging road and those in the purple polygon extension, shown in figure 4, we recommend enclosing each site with small logs and woody debris collected from the site and laying dry mosses as a bed instead of mulch. Although these are the recommendations we have for the site, we expect the Conservancy to use their own discretion in selecting which design is most suitable for their vision of the backcountry campsite, whether that be using mulch, moss, or nothing at all. In sourcing mulch for the tent plots, there is

potential to collaborate with the firewood forest project and use resources available from that project.

### Learning Site

Although there are typically “fewer structures in a backcountry campsite” (trails and sites BC, p.52), we believe having an area within the campsite to facilitate collective, nature based learning and meetings is an important aspect of the backcountry campsite. Shown as a yellow polygon in figure 4, we have selected an area in the northern portion of the site for the learning space. This area is approximately 12 meters wide and 10 meters long and on a relative clear and flat patch, which makes it an appropriate location. Removal of Bull Thistle and invasive grasses is necessary to help define the site. There are approximately 4-8 stumps in the area that may need to be removed. If these stumps are removed, we recommend re-purposing to use them as additional seating in the area. Maintenance of the area is quite simple, and does not require much more than weed-whacking tall grasses and watching for Bull Thistle.



Figure 5: Part of the proposed learning space within the backcountry campsite.

To facilitate the comfort of groups using the area as a learning space, we recommend implementing a tent or shelter cover with one or two picnic tables (as seen in figure 6). Tent and shelter options include a simple tent, similar to the one present at the Learning Center, or to facilitate a more backcountry composition, a shelter created with wooden logs. We understand



that a greater abundance of resources is required to create this shelter and it is a more permanent structure, but we feel that this will be more durable and appropriate given the nature of the site. In addition to the shelter seen in figure 6, we propose increasing the size to accommodate a small above-ground, deep-cauldron fire pit located in the middle of the structure, for groups to enjoy added comfort (seen in figure 7 below).



Figure 6: An example of a wood shelter that could be used in the backcountry campsite learning space. Our recommendation is to create a similar structure without the concrete base. Retrieved from: <http://www.trilliumdell.com/timber-frame-pergolas-porches-pavilions.html>



Figure 7. An above ground, steel cauldron fire pit proposed to fit in the middle of the shelter, in between picnic tables. Retrieved from <http://jianshenginc.net/Large-Steel-Cauldron-Fire-Pit-p23.html>

## Outhouse Facilities

According to Sites and Trails BC (p.52), “a single pit toilet should be located on the main trail to mark the campsite location”. Shown in figure 4, the red polygon indicated the proposed location for 2 outhouse facilities. This area was chosen because it sits in close proximity to the main trail, but tucked behind the tenting area for smell reduction.

Designing an outhouse is quite simple. First a solid foundation must be established where a square hole approximately 1.5 meters wide and 1.5 meters or deeper lined with impermeable clay or plastic tarp lining and supported by wood panels is constructed (outhouse blog). It is important to keep the pit as impermeable as possible (see figure 8) to prevent water seeping in and waste material leaching out.

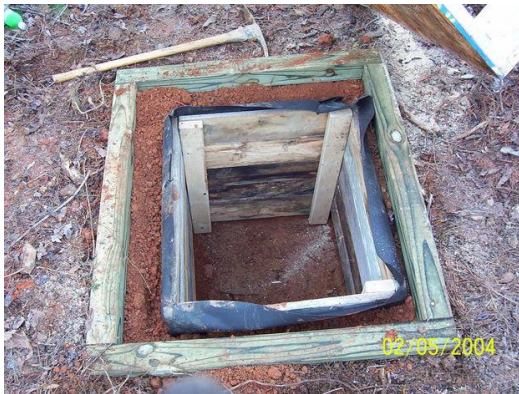


Figure 8: An example of an impermeable outhouse pit (Instructables, 2006).

Next, a frame built out of new and used wood materials should be constructed and fit to cover the outhouse pit (Instructables, 2006). ‘The frame should be stable but not too heavy’ because it may need to be transported to a new location in the future (Instructables, 2006). The roof of each outhouse structure should have a small opening, covered by mesh or wire to reduce insects, for good ventilation and air circulation (Instructables, 2006). There are numerous ways to construct an appropriate wooden frame, we recommend referencing an official building site for more accurate building instructions.

## **Outdoor Recreation Design**

This proposal focuses on the integration of a ropes course into a restored area as an outdoor recreational activity to incorporate into the GCA's existing educational programs for school and other visiting groups. This particular activity was chosen for its lasting impact on users, but its low impact on the surrounding physical environment.

According to Common Ground Adventures, a North-American outdoor adventure company, "one of the most unique benefits of a Low Ropes Course is its ability to engage participants by removing them from the challenges they ordinarily face" (para.2), and expose them to unique and wild tasks. Furthermore, this type of outdoor activity encourages group members to rely on one another through communication and physical support. Moving towards success in an activity, argues Common Ground Adventures, activates parallel thinking between the challenges in daily life and these activities.

The construction of a low ropes course can have little physical impact on its surrounding environment. The particular design that was chosen for the GCA's site, seen in Appendix D, uses recycled material collected from the trees and material cleared when constructing the campground. Physical characteristics of the location of the course- such as trees, tree stumps, and/or fallen logs- can be integrated into the structural design. This will lower the reliance and cost of importing materials and create the opportunity to choose sustainable construction. Using building material sourced locally (on site) will also act as a great educational opportunity for groups- they will be able to physically connect with the history and authenticity of the structure, rather than with only synthetic material.

Some of the structures are designed to be off of the ground, so minimal contact with surrounding flora is encouraged in certain areas. This means that native plant communities can and will be established around the structures, which will create a "wild" experience for groups using the course. It will allow individuals to interact directly with the trees, shrubs, edible plants and even the history of the site, and understand the different forms restoration can take. The layout of each activity also follows a trail, where users will be prompted to stay on the path that follows the course, instead of straying into thicker vegetation. As much of the backcountry campground site will be undergoing restoration of native plant species in order to begin construction, the course will be designed to incorporate native vegetation into its surrounds.

This project proposes 2 potential locations for the low-ropes course within the designated back country site and multi-use area. Figure 9 below shows an outline of each site. Each location is completely unique in its physical characteristics and can offer two very different ropes course designs. The selection of a site will depend on the amount of resources available to the Learning Centre for restoration and construction.



Figure 9. Proposed sites for the low ropes course, chosen for their suitable brush density and their proximity to the tent plots

Site 1 is a smaller area, but contains large trees, a few sturdy logs and a strongly established Salal brush community (see figure 10 below). Some Salal will need to be cleared in order to make a wide enough trail for construction and use of the course. Leveling will also need to be considered as this site sits on an approximate 15-20 degree southwest slope, which will make it challenging for safe use.



Figure 10. photo of the beginning of proposed site 1 for the ropes course.

Site 2 has a higher concentration of tree coverage, is wider in space and has level ground (see figure 11 below). Clearing of woody debris will need to occur, as well as the planting of more native vegetation (it is quite bare). Having a higher tree concentration means less reliance on synthetic or imported posts to construct the course. The site is also more challenging to approach and will require the creation of a small trail behind the campsites.

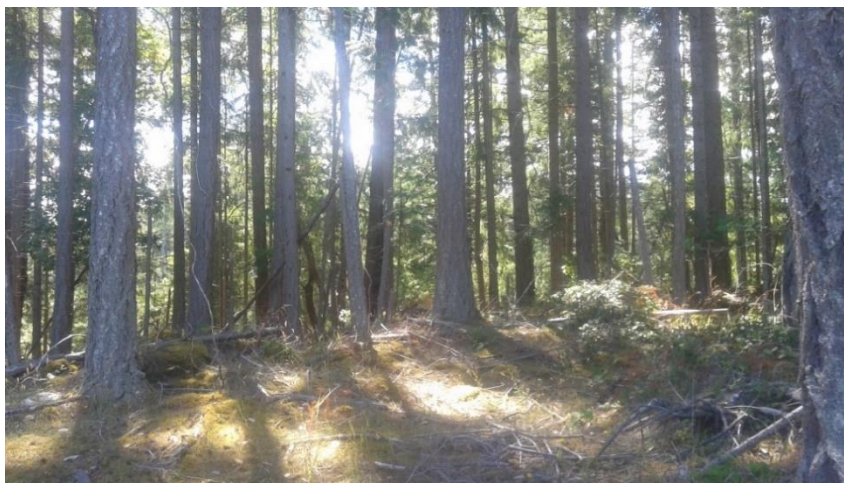


Figure 11. Beginning of proposed site 2.

The ropes course will closely resemble an obstacle course; participants begin at point A and attempt a finish at point B with their whole team. Each structure of the course offers a different physical and/or team challenge; balance, coordination, communication, and

cooperation. This course will be designed for self-directed older groups, but the educational leaders of the Learning Center can also provide guidance, especially to the younger, school-aged groups. A simple sign will need to be present at the beginning of the course stating rules, to ensure safety, and a safety inspection will need to be carried out before the course can officially be open to participants.

The different structures this project proposes are typical low ropes designs and can be arranged in any order. After careful research, the following activities will be best suitable for the proposed sites at the learning center. These structures can be found in the appendices.

The other piece of the outdoor recreation plan will be the maintenance of the hiking trails into the campsite. Designing the campground as “backcountry” encourages a rugged and rustic experience for participants, and also inspires groups to become even more familiar with their environment by navigating and carrying all of their belongings on their back. The opportunity to create a backcountry experience for youth groups slightly grazes the idea of Outward Bound’s company model; one that challenges individuals, with particular attention to youth, to push their personal boundaries, explore leadership and build inner resilience, whilst on multi-day backpacking excursions (Outward Bound Canada, <http://www.outwardbound.ca/our%20story/>). Figure 12 below displays the existing trails that need maintenance into the campsite. The red denotes hiking trails, and the blue shows road access (for younger groups who bring a bus instead). The hiking trails are currently overgrown with invasive species, wasp nests and dead woody debris. They will need to be cleaned up and weed-wacked to create a visible trail for users. The project is also proposing the trail have a 2-3 signs to guide hikers from Porlier Pass Road down to the backcountry campground. The signs can be constructed from used wood with some all-weather paint.

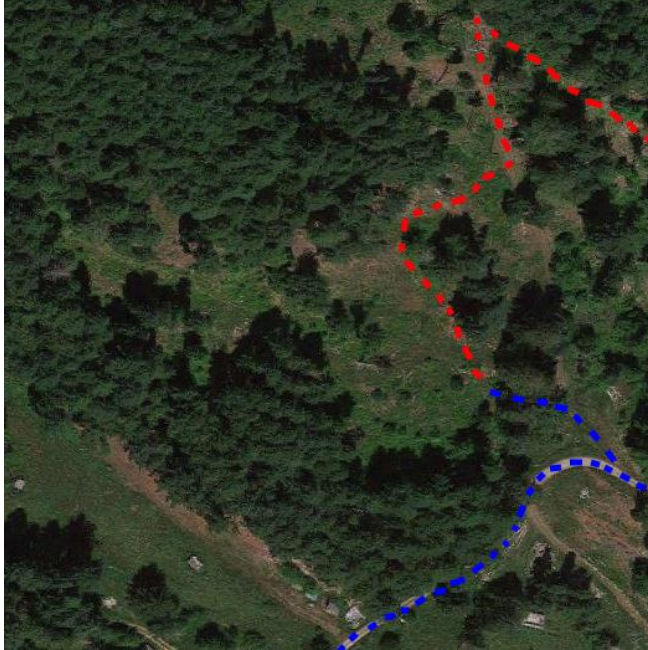


Figure 12. Trail network at the Backcountry Campsite. Red denotes recreational hiking, blue denotes vehicle access.

## Education

Creating a space for outdoor recreation and play for visiting groups at the Conservancy's Learning Center can also act as an educational experience. As previously stated, the recreational activities that the backcountry campground and low ropes course offer allow participants to explore leadership and team work- an essential piece in creating environmental stewardship. According to Richard Louv (2008), creator of the "Nature-Deficit Disorder" concept, nature allows children to express their creativity, offers a safe place to heal and an exceptional environment to learn hands-on. Education will present itself in active and visual forms that provide valuable lessons that cannot necessarily be learned in a classroom; a vision the educational programs at the Conservancy's Learning Centre possesses. "The Learning Centre will also provide participants with opportunities to build a sense of community, personal leadership and life skills. The Conservancy's Restorative Retreats will create life-changing learning experiences for inner city and marginalized youth, and will be open to people of all ages and backgrounds" (Galiano Conservancy, 2016, para.1). Offering an outdoor recreational experience will encompass community building, character enhancing and cohesiveness unique to the pre-existing educational programs.

Collaboration with the Learning Center's current educational programs will be a crucial

piece to integrate recreational activities with restoration lessons. We hope that the campground and outdoor recreation aspect can act as a more rustic learning experience for groups, while still learning the same concepts of restoration as groups that stay in close proximity to the Learning Centre's main building. We also hope that the ropes course can be integrated into the educational programs as a different kinesthetic way to experience restoration and learn about native vegetation.

Aside from collaboration with these educational programs, we are proposing the ropes course also include 2-3 interpretive signs, including a photo and short description of the flora surrounding the course. Figure 13 below depicts each proposed location for an interpretive sign, depending on the ropes course site that is chosen.



Figure 13. Each of the triangles represents a potential location for an interpretive sign. Red denotes the main welcoming sign into the campground, yellow represents signs for the proposed Site 1 for the ropes course, and blue for Site 2.

We also propose a larger sign at the entrance of the campground (indicated as the red triangle in figure 13), similar to the existing sign at the mill site (see figure 14 below). Materials for these signs could be simple, even more so than in figure 14. Recycled wood, if available, can be used, along with a board to post photos with either magnets or a plastic covering to keep from weathering.





Figure 14. The current interpretive sign located at the entrance to the Galiano Conservancy Association's Learning Center, next to the mill site restoration project. Retrieved from <http://galianoconservancy.ca/millsite>

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## Appendices

### Appendix A *List of Material*

Restoration	Design of Campground	Design of Recreational Facility			
seeds or sapplings:	reclaimed wood and new materials for learning area shelter	used wood/stumps/logs			
Salal	OR a tent structure for the learning area	tree straps			
Ocean Spray	used/recycled wood for each tent site	wired rope (or some other durable material)			
Oregon grape	tree stumps from area for learning area seating	rope clips			
Black cap raspberry	used wood for outhouse construction				
Big Leaf Maple	used wood for intrepreative signage				
Red Cedar	used wood for trail signage				
	nails, hammer,				
Fencing for protecting sapplings	mulch and/or moss for tent plots				
black mesh fencing	soil, logs, and tools for leveling the land				
	signage for interpretive signs				

### Appendix B *Restoration Plant Species List*

The species selected for this list are those that are low maintenance and compatible with the sun, shade, and moist to dry soils of the site.

Trees:

Arbutus (*Arbutus Menziesii*) – available at the GCA plant nursery; this species typically grows within 8 km of ocean, and is found on sites that are rocky with dry, rapidly draining soils that receive plenty of sun (Province of British Columbia). Arbutus, or Madrone, grows well alongside Oregon grape, Gary Oak, and several herbs and grasses (Province of British Columbia).

Douglas Fir (*Pseudotsuga menziesii*) – not available at GCA nursery; this species thrives in coastal regions, supports productive forests, and is the dominant tree species throughout the

campsite (Province of British Columbia). Douglas-fir can grow with Western Red Cedar, Hemlock, Salal, Huckleberries, Oregon-grape, and Sword fern (Province of British Columbia).

Western yew (*Taxus brevifolia*) – available at GCA plant nursery; Yew trees are a low spreading shrub to a small tree, 5 to 15 metres tall, that ‘occurs on a wide variety of sites, from dry and rocky to moist depressions and ravines’ (Province of British Columbia). It often occurs together with Douglas-fir, Western Red Cedar, and Western Hemlock, as well as plants such as Salal, Oregon-grape, or Skunk Cabbage (Province of British Columbia).

Shrubs:

Dull Oregon Grape (*Mahonia nervosa*) – available at GCA plant nursery; dull Oregon Grape grows up to 60cm in both shade and sun and moist to dry soil in mixed and deciduous forest (Washington Native Plant Society). This shrub is great low maintenance ground cover and forest understory and is currently present throughout the site (Washington Native Plant Society).

Sword fern – (*Polystichum munitum*) – available at GCA plant nursery; this fern prefers moist to dry soil with some sun, and can grow between 1-1.5m throughout mixed, old growth, and deciduous forest (Washington Native Plant Society).

Orange Honey Suckle (*Lonicera ciliosa*) – available at GCA plant nursery; Orange Honey Suckle is a vine that grows in moist soil, part to fully sunny areas, along forest edges and open forest (Washington Native Plant Society). The vine can grow to 6m and provides nesting and fruits for small birds and the orange flowers are aesthetically pleasing while their nectar attracts Humming Birds hummers (Washington Native Plant Society).

Salal (*Gaultheria shallon*) – not available at GCA plant nursery; this shrub typically grows 3-7 m tall, in shade and sun, and moist to dry soil throughout old growth or coniferous forest. (Washington Native Plant Society) Salal makes great understory, provides nesting and foraging habitat, and is currently present in thickets or clusters on the site (Washington Native Plant Society).

Black Cap Raspberry (*Rubus leucodermis*) – available at GCA plant nursery; Black Cap Raspberry is typically a 50cm shrub but can grow as large as 180cm (Washington Native Plant Society). Optimal growing conditions include dappled sun, moist soil, in fields and open wooded hillside among Red Elderberry, Salmon Berry, Trailing Black Berry, Salal, and Red Alder (Washington Native Plant Society).

Red Elderberry (*Sambucus racemose*) – Available at GCA plant nursery; Red Elderberry is a tall, 6m shrub, that grows in partial to very sunny conditions with moist soils in open forest, thickets, forest edge, disturbed sites, and pastures or fields (Washington Native Plant Society).

Red Huckleberry (*Vaccinium parvifolium*) – Available at GCA plant nursery; this species grows 1.5-3m in a mix of shade and sun, moist soil, throughout coniferous and old growth forest with a preference for nurse logs (Washington Native Plant Society).

Trailing Blackberry (*rubus ursinus*) – not available at GCA plant nursery; this berry can grow in approximately 50cm clusters and thrives in moist to dry soil with mix of sun and shade in open, old growth, mixed, and coniferous forests (Washington Native Plant Society). This berry was selected for its small, tasty fruit and its ability to grow alongside other shrubs, rather than dominate the landscape.

Invasive and problem species:

Stinging nettle (*urtica dioica*) – this native species is problematic for trails and campsites due to small spines within the leaves that release mild acid causing a burning or stinging sensation (Washington Native Plant Society). Removal by pulling while wearing thick gloves or using a shovel to target roots near tenting areas and throughout trails ensures the comfort and safety of campers.

Bull thistle (*Cirsium vulgare*) – can form large thickets, 60-180cm, and prefers sunny, open areas. Thistle can tolerate a wide range of conditions, including a range of moist to dry soils, and is typically found in disturbed areas such as roadsides, trails, logged areas, vacant land, pastures and cultivated land (King County). This invasive plant has the capability to spread fast and can

produce up to 5000 seeds per season (Grant, 2014, Bull thistle control: Managing Bull Thistle Plants in Gardens, para. 2). Some seeds can survive up to 5 years in the soil (Roberts and Chancellor 1979, cited in Sieg, 2003).

Prevention: Bull thistle reproduces by seed, thus prevention of seeding and taking care not to spread seeds are key to averting new infestations (King County). Do not leave cut stems of flowering bull thistle on the ground because they are likely to form viable seed after they are cut and flowering stems should be collected and destroyed to keep from forming viable seed (King County). In order to reduce the seed population, it is best to cut off the head of the plant and put it into a bag to keep the seeds from dispersing (Grant, 2014, Bull thistle control: Managing Bull Thistle Plants in Gardens, para. 2).

Manual control: Bull thistle can be dug up with a shovel and usually removing the top 2-3 inches of root is sufficient to kill the plant, especially after it has bolted, or produced stems (King County).

Grasses – We are unsure of the names of the numerous grass species that currently dominate much of the site. What is certain, is that Agronomic Eurasian and European grasses are highly invasive, have an exceptional colonizing rate, and reproduce rapidly (Parks Canada). Many native plants are usually slower growing, take longer to establish in an area and do not produce as many seeds (Parks Canada and Wilderness Society). Prevention is repeatedly prescribed as the best policy to introduced species because eradication of an invasive species can be labour-intensive and, in many cases, expensive or impossible, ‘once an invasive species is widespread, its control will often require ongoing maintenance entailing an infinite financial commitment’ (Parks Canada and Wilderness Society).



Appendix C *Site Review*



Figure 15. Much of the backcountry site is overgrown with invasive grasses and Bull Thistle as well as scattered with large woody debris and slash piles.



Figure 16. This photo shows part of the site proposed for the low ropes course; there are extensive Bull Thistle patches, Stinging Nettle, and woody debris.

## Appendix D *Suitable Low Ropes Structures*

The different structures this project proposes are typical low ropes designs and can be arranged in any order. After careful research, the following activities will be best suitable for the proposed sites at the learning center. In no particular order:

### Spider web (Figure 17)

A patterned placement of rope between two logs or trees, as seen below in figure 4. The object is to get each team member through the spider web without physically touching any of the ropes.

Materials: trees, or old logs placed upright, rope, tree straps



Figure 17. Spider web ropes course activity. Retrieved from <http://www.cooperfarm.org/apps/photos/photo?photoid=83360076>

### Balance beam (Figure 18)

A single log or plank balanced on levelled ground (see figure 18 below). All team members are required to stand on the log and swap places in sequence with height (highest-lowest) or birthdays (January-December).

Materials: A sturdy log in a somewhat cleared area (not a rotted one).



Figure 18. A balance beam. Retrieved from <http://www.cooperfarm.org/apps/photos/photo?photoid=83360076>

#### Tightrope walk/cable traverse (Figure 19)

A tightrope connected by two logs or trees 30-60 centimeters off the ground, and again higher (1.2-1.5 meters) for a hand hold. Participants are required to walk on the rope from one beam or tree to the next without falling; falling means the whole team starts again.

Materials: Heavy rope- preferably wire, 2-4 trees, tree straps



Figure 19. Tightrope cables attached to wooden poles. Retrieved from <http://www.cooperfarm.org/apps/photos/photo?photoid=83360076>

### Low Multi-vine (Figure 20)

This activity is similar to the cable traverse, but has long ropes hanging vertical from the top rope for a different variation on tightrope walking (see figure 20 below). Participants are required to move, as a team, from one tree or pole to the other without falling, and can use the rope



Figure 20. A multi-vine rope activity. Retrieved from <http://www.cooperfarm.org/apps/photos/photo?photoid=83360076>

As seen in the above photos, the materials required for the construction of these structures is fairly simple. The wooden poles can be replaced by trees found on both proposed sites. Wire rope will need to be purchased for a few of the activities, to ensure that the structures are stable and can withstand many users. The other building materials required for stability are tree straps, a minimally invasive way of holding the rope around the trees (see figure 21 below) and clips to join the wire rope with the strap (also seen in figure 21).



Figure 21. Tree straps. Retrieved from <http://www.ropecourseconstruction.com/low-ropes/>