

# Ecosystem Restoration in Oaklands Community, Victoria, BC

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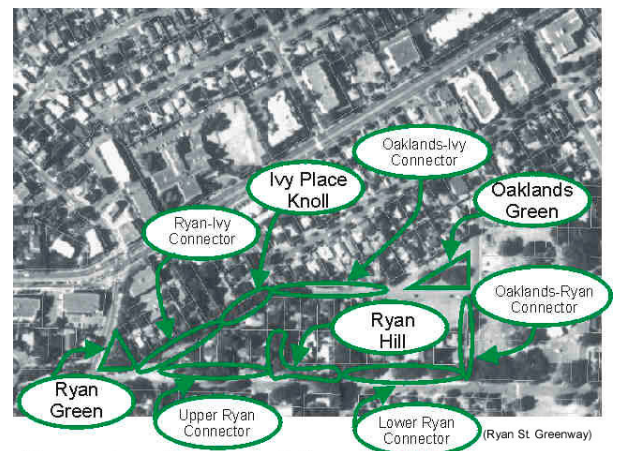
Professor Richard Hebda

## Abstract

As cities expand, natural areas diminish. In urban settings, there are many challenges to natural processes and their continued sustainable functioning. The Oaklands community in Victoria, British Columbia, has undertaken a project to restore an ecosystem within an urban environment through an ecosystem corridor in the neighbourhood. A major step forward in this project has been the development of a greenway on the site of a former unmanaged parking lot that posed a threat to a stand of Garry Oak trees. Through community organizing, the site has been put on track towards a functioning ecosystem within the city by creating wildlife habitats and initiating soil development.

## Introduction

The city of Victoria is growing. Urban growth is both a trend locally and globally, and has tremendous repercussions on ecosystem functions. As human populations expand, more lands are converted from forests, wetlands, and meadows, to parking lots, housing developments, roads, and farms. This trend in growth does not show major signs of slowing down soon, meaning humanity will need to find creative ways to live with nature in the context of new urban environments. With this belief in mind, there are many projects that promote ecosystem restoration within cities. One such site centres on the Oaklands Community Centre. The plan is to create an ecosystem corridor that uses ‘marginal’ lands in the community – boulevards, empty lots, and so on. The ecosystem corridor, or the Oaklands-Ryan Greenway Loop, functions on the basis of having several parks



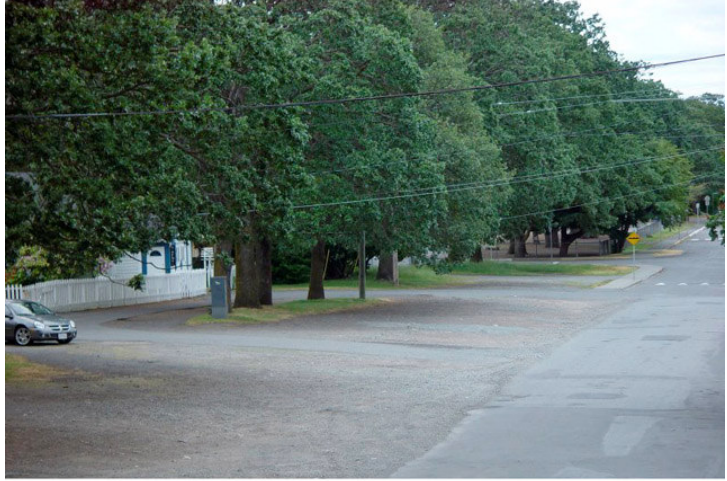
Ecosystem Corridor Map

planted with a diversity of native species, connected together by smaller paths. This enables migration and interaction of species within pockets in the neighbourhood and retains biodiversity. In an urban site ecosystem restoration is unique due to the fact that the human element is clearly dominant and will always remain so. For this reason, restoration challenges have more to do with the will of the people, than the capacity of nature to heal itself. In the case of the Oaklands-Ryan Greenway, we see a demonstration of the community's commitment to bringing nature into the city. One part of the corridor in particular on Ryan St. serves as an excellent example of bringing nature into an urban context. At the intersection of Belmont and Ryan streets, a line of Garry Oak trees (*Quercus garryanis*) stood surrounded by gravel parking lot almost to their bases. Through planning and commitment, this lot (and beyond) was converted into a greenway that will lead to restored ecological processes and biological richness. The processes that have led to the current (and future) state of the Greenway involved determined individuals, largely associated with the Oaklands Community Association, as well as members of local government, and the community at large. Special thanks to Ludo Bertsch of the Oaklands Parks Committee responsible for the development of the Greenway in helping with my research.

### **Ryan Street Greenway**

Anecdotal information suggests that there was a surveying error at Ryan St. around Belmont creating a wider than usual avenue (Bertsch, 2008). The extra space on the north side of the east-west street was left undefined, to be bordered by St. Alban's Church and an elementary school, along with several private residences. The street has

several Garry Oaks by estimates which are at least 120 years old. Garry Oaks are protected in the city of Victoria by municipal bylaws as they are a unique species with limited habitat range in



Before restoration. Garry Oak tree roots buried below parking spaces

Canada (Bertsch, 2008). However over time, the wider section of the street became a parking lot for cars to the point that cars were parking on all sides of the oaks, driving right up to the trunks. The ground became a highly compacted gravel bed with the trees roots buried below. The site was clearly no longer a Garry Oaks Meadow eco-system, once common in the Victoria area, but rather a suburban car-based anthro-system. The goal of many of the residents of the Oaklands neighbourhood in recent years was to



Digging up the parking lot

restore native ecosystems and protect the Garry Oaks. The citizens concerned organized themselves within the Oaklands Community Association Parks Committee in order to develop a Greenway plan,

which was supported over time by the municipality. Meetings were held to discuss the plan's details, pros and cons. The stage was then set for the ecosystem corridor framework in the Oaklands area including the Garry Oaks covered by compacted gravel,

and another lot that was protected from development known as the 1436 Ryan St. Lot on Ryan Hill where over 20 mature Garry Oak trees stand today. Once city approval was received to reclaim the parking lot, active ecosystem restoration commenced. The lot was dug up by city workers, exposing a relatively decent subsoil that was not too compacted to inhibit plant growth. 10 truckloads of topsoil were added and spread out along the site with an equal depth of mulch layered above, all provided by the city. Wooden fences were set up to demarcate the boundary of the greenway, and concrete wheel-stops were put in place to prevent cars from driving up too close off the street. Berms were also built of topsoil to prevent people and cars from entering the planting area. This all took place within the course of a few months, with planting on site during the spring of 2008.

## Results

At the Ryan St. Greenway, four major issues needed to be addressed in order to sustain an ecosystem: a) soil, b) hydrology, c) biodiversity, and d) the community.

Soil at the site was non-existent. Hard packed gravel is impossible to penetrate by plant roots and has little to no nutrient value. Furthermore, car traffic prevents even the hardiest plants from growing. The first step, then, was to stop the source of major disturbance. In the same way that logging and mining disturb ecosystems ‘in nature’, at Ryan St. the disturbance regime is car parking and traffic. The fences, wheel-stops, and



Wooden fence installation (Note concrete wheel stops in front of cars on the right)

berms were set up for specifically that purpose, forcing cars to park elsewhere, or at least farther away from the site to be restored. Once that was done, the ground was overturned by machine and stone-picked. The act of loosening up the earth and exposing subsoil allows freer root growth – although the subsoil onsite is still fairly dense substrate. The addition of topsoil and mulch provided an acceptable growing medium rich in humus for plants. With adequate soils, plants can begin to take root, adding organic matter and nutrients to the soil through leaf litter and detritus. Smaller organisms also have a place to live, breaking down matter and cycling nutrients through the soil.

The hydrology of the site before restoration began was inadequate to sustain plant life. Concrete and hard-packed gravel are impervious surfaces over which rainwater washes into the storm drains flowing downhill to the east. With the upgrade in soil quality onsite after breaking up the concrete and adding organic matter, hydrological cycling also is enhanced. The water holding capacity of soil is higher when organic matter is present and where there is a well-developed rhizosphere. Water retention and infiltration through the soil can better nourish the plants so that irrigation will eventually be unnecessary.

With the re-establishment of fundamental ecosystem process such as soil development and water retention, plants and animals can thrive. The selection of plants used on-site was based on a number of factors. Some plants, such as sedges, were planted in the depressed areas where water pooling was high. Strawberries (*Fragaria virginiana* and *Fragaria vesca*) and tall Oregon Grape (*Mahonia aquifolium*) were used to hold the berms in place, with Oregon Grape also acting as a boundary against people entering the planting area. Young Garry Oaks were planted to provide a future generation of deep-



Sedges and Ferns

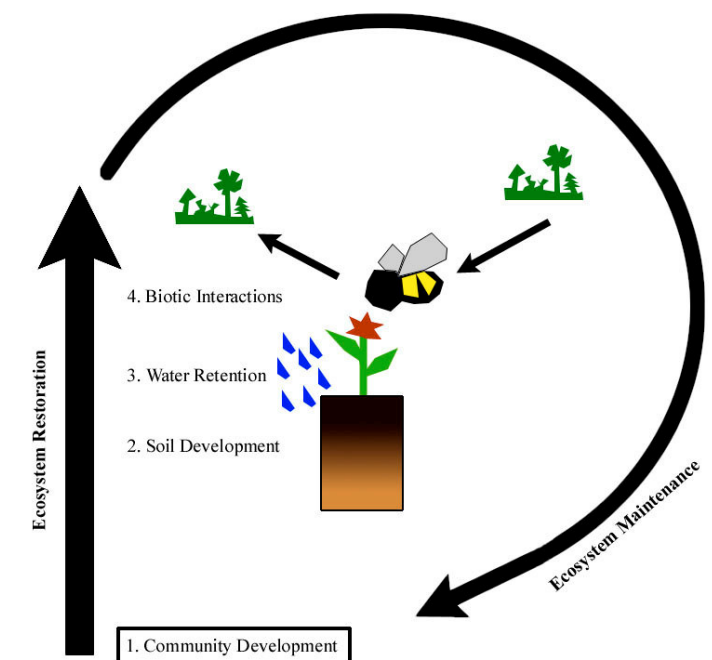
rooted tree. Other plants encourage butterflies and other insects, such as Shooting Stars (*Dodecatheon pulchellum* and *Dodecatheon hendersonii*) and Mock Orange (*Philadelphus lewisii*). All plants are native species. See the Appendix for a draft plan of the planting onsite and list of species used. The Ryan St. Greenway, however, is only just over a block long. The intention behind the ecosystem corridor is to link small patches of land within the city. The concepts put forth through island biogeography can apply within an urban

environment, where ‘islands’ are defined as small patches of habitat (greenways and parks), separated by uninhabitable barriers (roads and houses) (MacArthur, 1967). The key is then to link these islands by corridors so that squirrels, butterflies, bees, and other organisms are able to nest, feed, hide from predators, pollinate, and so on. In the greenway plan, Ryan St. is just one part of a bigger picture. It is a small area with a lot of pedestrian traffic, largely seen for its aesthetic value by residents. With well-established plant life, the site may be seen as a stopping point for non-human life as well. Imagine for instance a bee emerging from its hive in Oaklands Green Park, flying to the Ryan St. Greenway to get some pollen before ending up in the Ryan Hill lot where it fertilizes flowers.

Ultimately, however, there is the place of the community. In an urban environment, humans are the dominant species, and a project is destined to fail if the

people’s place in the ecosystem is not understood. The Ryan St. Greenway was initiated by community members who organized themselves to improve the land upon which they reside. In order to have a healthy ecosystem in a city, there must be a healthy community. Humans have the power to preserve, but also the power to destroy, and only with proper communication and organization can a community reclaim land, develop it, and maintain it. Ludo Bertsch described the key to success in the project as ‘changing how people act’; to eliminate the disturbance people would have to change their behaviour – such as parking their cars elsewhere and walking. So restoration, then, could not go forward without an understanding among the people who use the area. After the will to restore the land was established, the next move was to petition the city for support. Meetings and planning with city staff and members of government were conducted and on November 24<sup>th</sup>, 2005, after applying to the City of Victoria Neighbourhood Greenways Grant, the Parks Committee at the Oaklands Community Association was able to secure \$20,000 to develop Ryan St.

Altogether, this creates a picture of restoration where the community represents the foundation of the project – a shared desire to ‘green’ a ‘grey’ space in the neighbourhood. Upon this foundation we see the development of soils, hydrology, and ultimately biodiversity. It is vital that community involvement be present at all times as at



Ecosystem restoration in human dominated landscape



any stage in the process of ecosystem restoration in a city, construction, vandalism, traffic, re-zoning, and other anthropogenic disturbances can set back the project years.

## **Comparison**

An ecosystem is a community of organisms, with ecosystem restoration aiming to rebuild that community. In urban settings where biological communities are in tatters, so too are human communities. The challenge of urban ecosystem restoration is to sustainably restore humanity's place within nature. This involves working with natural processes and encouraging them if possible (such as plant growth or hydrological functioning) and cycling inputs and outputs (through eating locally produced foods and recycling waste products).

In London, England, a project was initiated that aimed to restore vital ecosystem processes. The William Curtis Ecological Park was created on former warehouse lands that had been razed (Dutton, 1982). The park formed out of a partnership between the Southwark Borough Council and the landowners (Hays Wharf) who provided much of the investment in the reclamation. Some of the site was bulldozed with subsoil and spoil added, but much was left as is for natural succession to occur. Volunteers planted trees, seeded, cleared rocks, dug pools, and prepared plant beds onsite. After 3 years, over 250 species of plants, and over 250 species of animals were recorded. Much land in urban areas has been contaminated, or developed upon, and then left unused. Many war-torn cities have been destroyed, with large areas left in rubble. These sites, while distressing, can be future sites of life-sustaining rivers, wetlands, meadows, or gardens. Soil contamination studies can be conducted to search for heavy metals and chemicals which

are dangerous to human and ecosystem health. The site's historic uses must also be taken into account before site restoration can occur.

Cities are very wasteful. It is estimated that the city of London, England, uses an area 120 times its own size for raw materials, food, waste disposal, etc (Srinivas, 2008). The LifeCycles Fruit Tree Project in Victoria is an initiative that collects fruit from trees across the city for distribution to those in need. In cities, people generally eat imported food and produce exported waste. Ecosystems are the opposite, where outputs are cycled through the system and eventually become used as inputs once again. Thus, through growing food locally, and establishing ties within communities and the land, the ecosystem model begins to enter the city.

## **Discussion**

Creation of an interconnected series of parks and green spaces in the Oaklands area is an excellent step towards re-introducing natural ecosystem functioning. In the city, we are beyond the point of concern over species extinction and preservation, so we must focus on bringing what we can back. Habitats have been destroyed, streams diverted and polluted, and soils paved over. Urban development is at odds with ecosystem development to the point that even conceptualizing an urban ecosystem is unheard of. In Oakdale community in Victoria, there is clearly a heightened sense of place as residents have come together to move their community away from a typical view of the city into one that increasingly incorporates natural processes. The question is how far can this be implemented? Will urban ecosystem restoration end at aesthetics? Ecosystems are complex interactions between species and the environment. At the microscale, a city

block may have a few different habitats for insects, but can an ecosystem function across ten city blocks? In order for larger-scale processes to develop and sustain, communities will need to come together across the city, working with local government, and extending up the scale – across the greater Victoria area, and upwards through higher levels of government. City planners and residents must think about what the future will look like generations down the line. Is the city sustainable? From the food eaten by residents and the energy used to import it, to the tap water used to grow lawns, sustainability is key. How long will our water supplies last before lawns are widely accepted as wasteful? At what point will transportation costs make imported food impractical? The Greenway is still in its infancy. Over the years, it will still require maintenance. As Ludo puts it:

‘we’re still experimenting’. Some plants may die, some may thrive. It is a process. Over

time, however, it is vital that the system require no more inputs than can be generated locally. Constant additions of fertilizer and topsoil are not sustainable. We have to think of urbanization with an ecosystem model, so that waste from the city can be used by the city. Food waste



Volunteers planting in the new greenway

can be collected from households, for example, to be turned into compost for use in developing naturalized areas, and to produce food in local gardens. Development of such strategies, organizing communities, and political lobbying takes time, so unfortunately it

may be a few years before the Ryan St. Greenway supports a community of plants that can sustain itself without renewable inputs.

It is vital that community organizations build on the successes of the past. The beauty of the Ryan St. Greenway speaks for itself. It is proof of what can be done within the confines of urban environments. As more people and communities witness the gains made by the Oaklands community, public pressure will spread and demand will grow for more nature in the city. The Oaklands community is very fortunate to have city councilors onside, and as public pressure grows, so too will the number of eco-friendly councilors, workers, bureaucrats, and even developers.

## **Conclusion**

In the city, ecological processes have been overrun, and with it biodiversity and residents' access to nature. Thanks to 'green-minded' citizens in the Oaklands area, nature has been recovering. Where reclamation was once defined as making lands useful for humans by paving over forests, in Oaklands it refers to the destruction of paved lots for the benefit of nature. Community power is vital to the success of the Oaklands project. The understanding of ecological principles and values are a shared driver behind the initiation, development, and maintenance of the Ryan St. Greenway and greater ecosystem corridor plan. Just by spending a day at the site, I was inspired by the positive influence this space has on the neighbourhood. It is a throughway for the people in the area and for their non-human neighbours as well.

## **Acknowledgements**

Gracious thanks to Alana Stewart at the Oaklands Community Centre and Patti Parkhouse from the VicWest Gardeners for helping me with my research. Special thanks to Ludo Bertsch for the photos and site plan included in this report as well as his in-depth, firsthand knowledge of the place and processes that led to what the Greenway is today.



**Planted Species on Ryan St. Greenway**

<b>Common Name</b>	<b>Latin Name</b>
Garry Oak	<i>Quercus garryana</i>
Shooting Star	<i>Dodecatheon pulchellum</i> and <i>Dodecatheon hendersonii</i>
Mock Orange	<i>Philadelphus lewisii</i>
Sword Ferns	<i>Polystichum munitum</i>
Red Flowering Currant	<i>Ribes sanguineum</i>
Camas	Genus <i>Camassia</i>
Baldhip Rose	<i>Rosa gymnocarpa</i>
Satin Flower	<i>Clarkia amoena</i>
Chocolate Lily	<i>Fritillaria biflora</i>
Beaked Hazelnut	<i>Corylus cornuta</i>
Oregon Crabapple	<i>Malus fusca</i>
Fawn Lily	Genus <i>Erythronium oreganum</i>
Western Yew	<i>Taxus brevifolia</i>
Indian Plum	<i>Oemleria cerasiformis</i>
Black Hawthorn	<i>Crataegus douglasii</i>
Dogwood	Genus <i>Cornus</i>
Slough Sedge	<i>Carex obnupta</i>
Strawberry	<i>Fragaria virginiana</i> and <i>Fragaria vesca</i>
Oregon Grape	<i>Mahonia aquifolium</i>

## **FURTHER READING**

Ryan Greenway Website – Includes maps, timeline, plans related to the Greenway plan  
<http://www.blockcommunities.com/greenwaysoaklands.html>

LifeCycles – Details on fruit tree project, and other projects in Victoria  
<http://www.lifecyclesproject.ca/>

UVic Garden – Community gardens at the University of Victoria  
<http://web.uvic.ca/~ccgarden/>

City of Victoria Community Garden Plan  
[http://www.victoria.ca/cityhall/pdfs/cmmnty\\_garden\\_policy.pdf?zoom\\_highlight=gardens](http://www.victoria.ca/cityhall/pdfs/cmmnty_garden_policy.pdf?zoom_highlight=gardens)

UN Report on Urban Growth  
[http://www.un.org/esa/population/publications/wup2001/WUP2001\\_CH3.pdf](http://www.un.org/esa/population/publications/wup2001/WUP2001_CH3.pdf)

Sacramento Conservation Plan – Report addressing conservation issues around the city  
<http://www.planning.saccounty.net/gpupdate/docs/2007/Public-Review-Draft-Elements-Policy-Section/Final-Draft-Conservation-Element-2007-05-30.pdf>

Dockside Green – New community development in Victoria aimed at sustainability  
<http://www.docksidegreen.ca/>



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