

Green Value Strategies & Develop with Care Case Studies

Welcome to the collection of Green Value and Develop With Care case studies regarding initiatives on Vancouver Island. These cases review real estate development projects in Vancouver Island communities. The production of the case studies was made possible by the partners in the Convening for Action on Vancouver Island (CAVI) Leadership in Water Sustainability initiative. A grant from the Real Estate Foundation of British Columbia paid for the four Green Value Case Studies. The Ministry of Environment paid for the Develop With Care case studies.

Green value refers broadly to approaches to use and conservation of land, including the natural and man made assets upon it, which take into account ecological capital (assets/resources) as well as market and social capital. For example, re-infiltration of rainwater on a development site, which may be a water sustainability strategy, helps protect the hydrology of an area and the health of related streams and wetlands. LEED certified buildings save on energy costs, contribute to water sustainability, and so on.

These case studies illustrate how green value approaches have been implemented and the benefits/liabilities of each project.

Green value means thinking about and realizing land use strategies that accommodate settlement needs in practical ways while protecting the ecological resources upon which our communities depend. Understanding green value approaches provides positive options for managing growth, the design of communities and buildings while sustaining environmental integrity.

May 2007



Green Value Case Studies

These case studies were made possible by a grant from the Real Estate Foundation of British Columbia.

Develop with Care Case Studies

These case studies were made possible by funding from the Ministry of Environment, Province of British Columbia.

Green Value Strategies on Vancouver Island

PROJECT TITLE:

Blenkinsop Creek Relocation & Restoration

■ OVERVIEW

The Blenkinsop Creek Relocation Project won the 2002 Federation of Canadian Municipalities / CH2M Hill Sustainable Communities award. Five years later it is still widely considered to be an excellent example of both good stream relocation practices and community development/ cooperation practices.

Blenkinsop Creek itself is the major tributary to Swan Lake, an urban lake surrounded by the Swan Lake Christmas Hill Nature sanctuary in the middle of the District of Saanich on Vancouver Island. Declining water quality in Swan Lake had been a concern for the Swan Lake Christmas Hill Nature Conservancy (SLCHNC) for several years. The Creek has been severely channelized by agriculture and urban development throughout the watershed and is the receiving body of water for urban storm drainage. It was a rough ditch where it entered the lake, passing through Galey Brothers Farm.

Patrick Lucey, a principal with Aqua-Tex Scientific consultancy, had been active with SLCHNC for many years. He saw an opportunity for a stream restoration project that would address the creek's water quality issues and bring some collateral benefits to the community and the landowners, Judy and Ray Galey.

The Galey's were interested in Lucey's proposal, though as Judy Galey expressed it, the ditch "looked like a ditch, worked like a ditch," and they were somewhat surprised at its potential as a stream. They had some additional concerns. A municipal trail system adjacent to the property already brought vandalism and trespassers onto the Galey Farm on a regular basis. A rehabilitated stream with trails raised the issue of enlarging what the Galey's already experienced as de facto (and expensive) municipal encroachment on their lands.

Over the course of time and many conversations, Lucey and his partner, Cori Barraclough, were able to gain the confidence of the Galey's. Aqua-Tex was also able to secure the participation and support of the municipality, which had been working cooperatively with the SLCHNC to restore the upper watershed in stages, as infill development and re-development occurred. Aqua-Tex also secured funding for the work and managed the project through to completion.

The project restored approximately 700 metres of Upper Blenkinsop Creek by relocating and restructuring the channel, replanting riparian vegetation and allowing the creek to access its natural floodplain. Two fields, previously divided by a ditch, were joined, allowing Galey Bros. Farms to utilize a single irrigation system and to use one access road instead of two. Even though the riparian area created was larger than the ditch it replaced, the farm increased the land under cultivation by 7%. Moving

the creek alongside the edge of the property allowed the use of an existing vegetative buffer linking to Lochside Trail, and the creation of viewpoints (of habitat and farm) from the trail. This has had a positive impact on the farm.

All accounts of the project describe a positive experience. It is widely seen as having provided valuable learning opportunities, and as generating overall feelings of goodwill. It has also improved the quality of water flowing into Swan Lake.

■ PROJECT HIGHLIGHTS

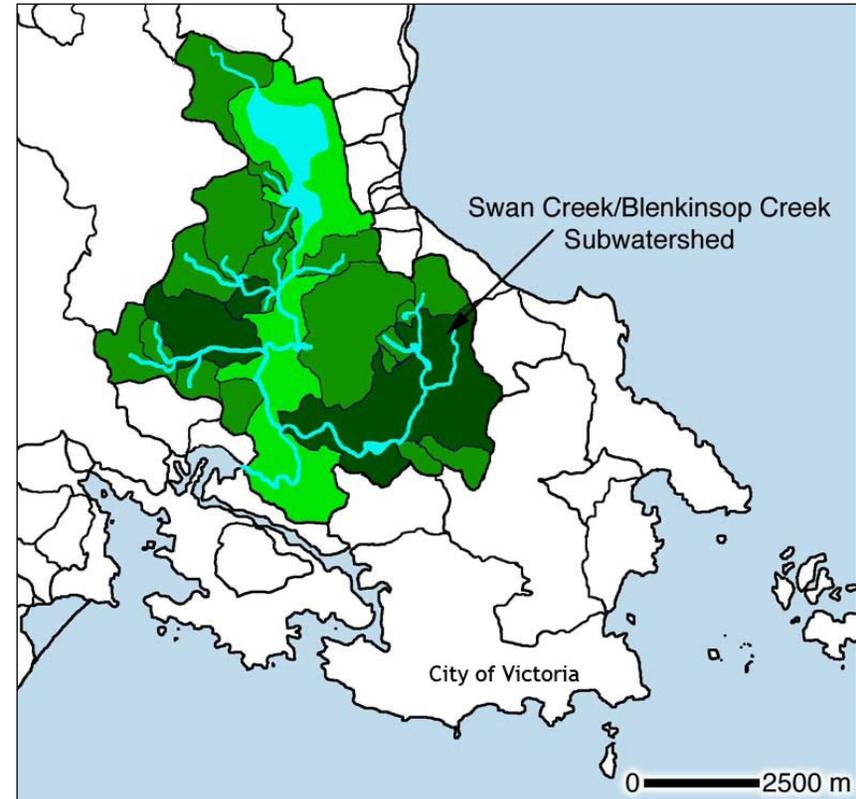
Location

4400 Blenkinsop Road
District of Saanich, BC
Vancouver Island

Landowner

Judy and Ray Galey
Galey Brothers Farm
Project Type & Size

The project involved restoration of approximately 700 m of Upper Blenkinsop Creek, through 21.4 acres (after stream realignment) of farmland.



**Colquitz River watershed in Saanich, B.C.
on southern Vancouver Island.**



Blenkinsop Creek study area.

Challenge / Reason for Project

There were several reasons for this project, including:

- poor water quality flowing into Swan Lake
- impediments to efficient use of agricultural land, and
- poor linkage within the Lochside Regional Trail network.



AQUA-TEX SCIENTIFIC CONSULTING LTD.

Proposed Solution

The proposed solution was conversion of a 'severely channelized' stream (i.e. ditch) into a properly functioning stream with a natural-type riparian area and stream-side trail. In the process, this would relocate the stream from the interior of a farm field to the field's edge.

Start Date

Preliminary discussions with the landowner began in 1999. Construction started in the summer of 2001.

Completion Date

Waters returned to the creek in late August 2001, in time for a '100 year flood' in December 2001. Planting of the site was completed in Fall 2001.

■ CONTEXT

Project Funding

The cost of the Blenkinsop Creek Relocation Project was \$375,000. Funding and resources came from multiple sources and involved cooperation and participation of diverse organizations, including the District of Saanich, Eco-Action (federal), South Island Aquatic Stewardship Society, Environment Youth Team (Ministry of Environment, BC), as well as matching funds from the Natural Sciences & Engineering Research Council (L.Malmkvist, biologist) and volunteer labour & in-kind donations from Aqua-Tex.

Caveat

While stream rehabilitation (and even stream creation, as in this case) is an attempt to restore naturally functioning systems, this is not restoration to a pre-development state. The project is an incremental step, significant but still only a step, towards a naturally functioning system. Balance between the limits and opportunities presented by a site, and the various constraints presented by the landowner and various regulatory bodies is the goal. Over time it is hoped that the balance will shift towards the benefits to be gained through a more naturally functioning stream system.



Regulatory Environment

This project was undertaken prior to the introduction of Riparian Areas Regulation under the Fish Protection Act (the RAR came into effect in March 2006). At the time, approvals were required provincially under Section 9 of the Water Act and federally from Department of Fisheries and Oceans.

Municipal Vision

The fact that this project took place within the bounds of the District of Saanich is no accident. The District was one of the first municipalities in BC to actively address storm water management and quality of streams issues. As a response to development pressures on rural lands in the municipality in the late 1970s and early 1980s the District established an urban containment boundary. Former District Deputy Engineer Rick Lloyd notes that

as development approached this boundary, the municipality became increasingly aware of the damage that was being done to streams and wetlands.

Lloyd says that work done on the principal watershed in the District, Colquitz Creek, is an example of how Council action (i.e. land acquisition, park development, willingness to work with developers and conservation organizations, etc.) and municipal bylaws concerning storm water management, can help to rehabilitate a stream in the midst of urbanization.

Despite these positive conditions, there was an issue amongst staff regarding the nature of the design proposed by Aqua-Tex, and a re-design was requested in the middle of the project. In the end, after the re-design had been done, the original design was accepted and constructed, with the stream relocation/rehabilitation done according to the original specifications. As staffing at the District has changed since the project was begun, it is not clear what the exact nature of these concerns was at the time.

Approach

The consultants' approach to freshwater systems rehabilitation was to focus on collaboration and experimentation/innovation within 'modules of opportunity'. In order to present the consultants' vision for the project, identify common goals, address immediate concerns, as well as to obtain support from the landowner and all the municipal, provincial, and

federal regulatory bodies, everyone was invited to a site visit. Consequently, cooperative relations were established between all parties and approvals were expedited. This underlines Rick Lloyd's (District Deputy Engineer at the time) assessment of the key features of this project: local government's prioritization of stream stewardship, the spirit of collaboration between all parties involved, the prospective landowner's willingness to try a new approach, and Patrick Lucey's leadership role.

Agricultural Efficiency Issues

As a result of the divided agricultural field, three roads (one along the edge of the field, one on either side of the ditch), three bridges, and two irrigation systems (one for each portion of the field) were required. The Galey's had to deal with a difficult to plow narrow field on one side of the field and difficult to access lands near electrical pylons.

Trail Related Issues

The municipality had specified linking existing Lochside Trail 'disconnects' as important to their trail development plan. From the landowners' point of view, official linkages were necessary to address expensive and irritating trespass and vandalism issues (estimated to cost in excess of \$100,000/year). These occurred due to poor public access to the existing trail network significant numbers of cyclists, hikers, and passers-by wandered onto the farm roadways and fields, failed to give way to farm machinery and vehicles, and so on.

■ SITE CHARACTERISTICS

Water Quality / Biodiversity Issues

As indicated in the overview, declining water quality in Swan Lake had been a concern for several years. In addition, there were concerns about low biodiversity.

Fauna / Flora

The Victoria Natural History Society had undertaken a bird count in the region. The project was adjacent to a known green heron nesting area, which required compliance with a detailed working protocol. Ironically, the young herons became quite familiar with the working crew, often 'playing' with the excavator on site.



Soil

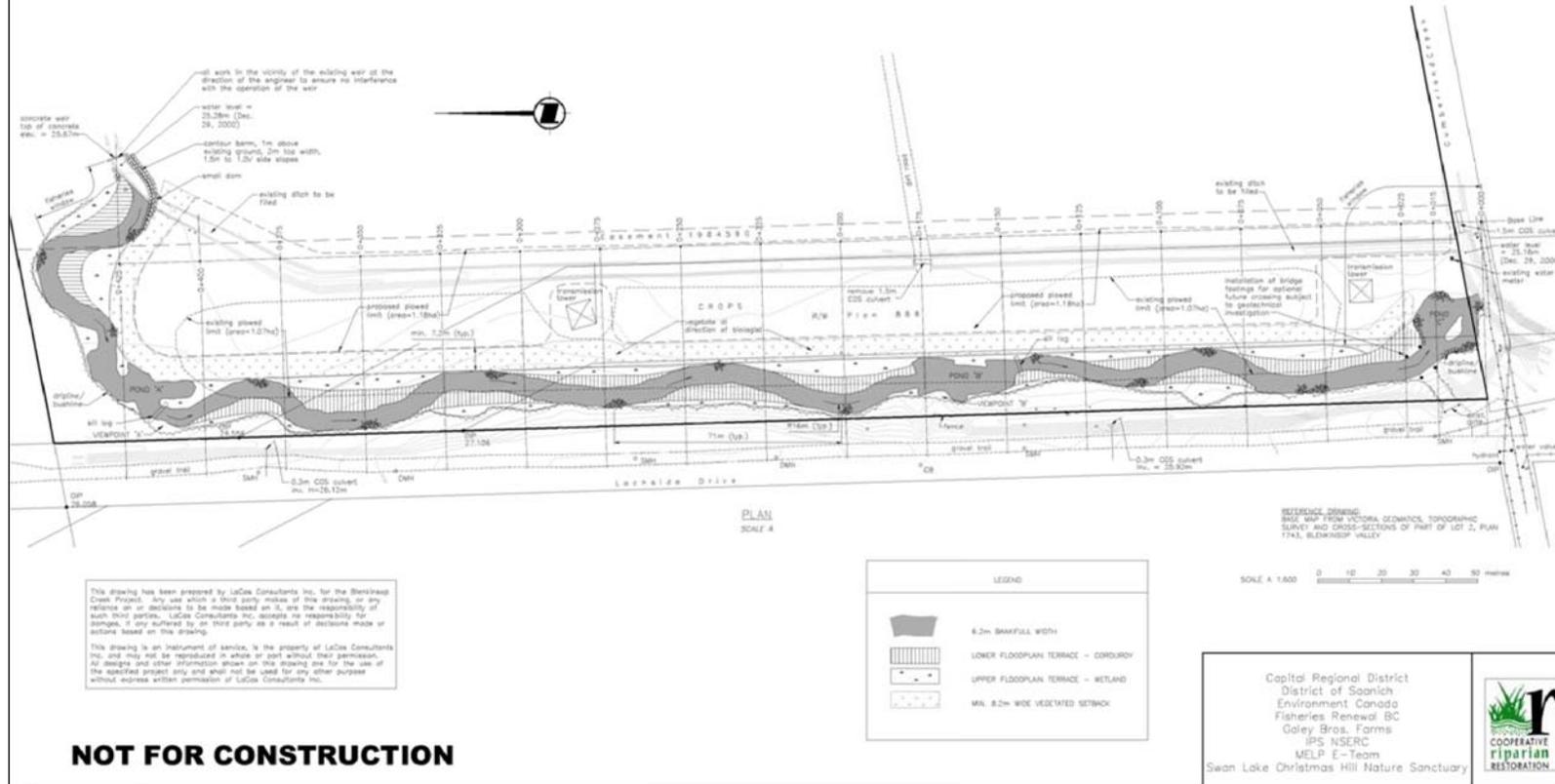
This was a drained lakebed (drained in early 20th century as part of railway construction and agricultural development). A layer of topsoil was underlain with marine clay. The presence of clay had not been identified when the project began, and subsequently became a construction and cost issue (resolved by collaboration with the District of Saanich and a neighbouring landowner).

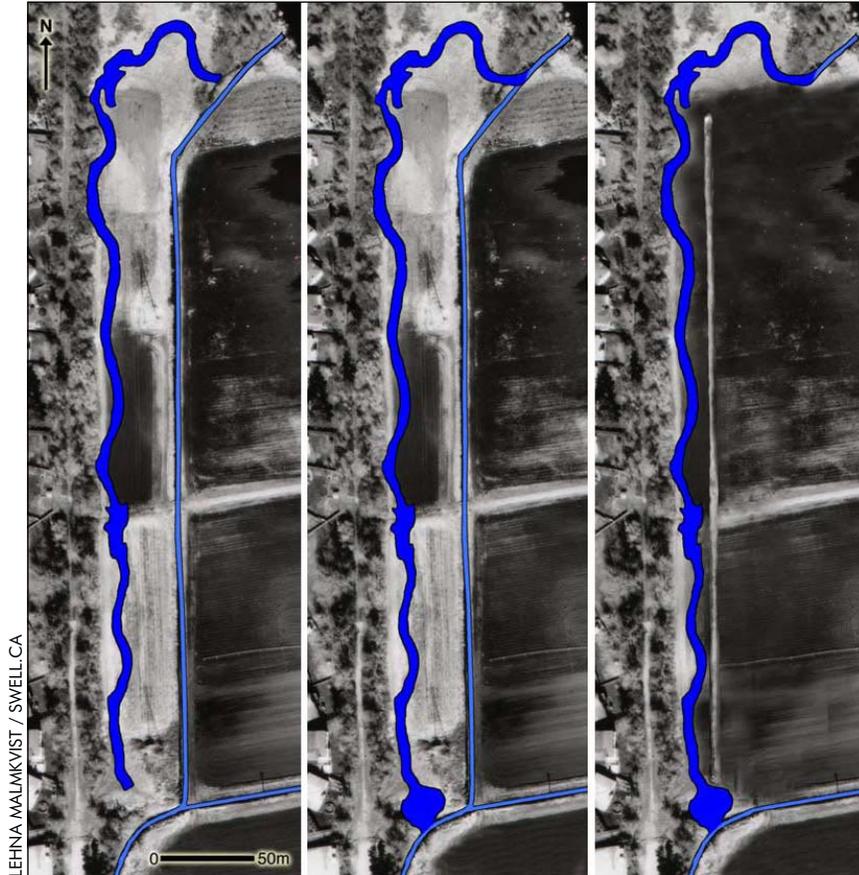
■ ECOLOGICAL DEVELOPMENT METHODS

Hydrological modelling of the Blenkinsop Creek watershed was done, along with a Proper Functioning Condition (PFC) assessment (refer to the *Additional Related Materials* section of this study for an explanation of PFC).

The Stream channel was designed to suit expected natural flows and landform, and large wood (comparable to what exists in natural streams) was used as the framework for the stream channel, including the stream bottom. Invasive species (e.g. blackberries) were removed and native vegetation, which could provide high stream bank integrity, was planted. Construction timing suited the needs of nearby nesting Green Herons.

UPPER BLENKINSOP CREEK RESTORATION PROJECT





■ COST / BENEFIT ANALYSIS

Municipal Costs / Benefits

Benefits to the municipality/region include linkages to Lochside Regional Trail network and the continuation of Colquitz Creek watershed rehabilitation.

Municipal staff (past and current) were very positive about the benefits of this project. Municipal park and trail lands are a neighbour to the private lands on which the development took place. Parks staff noted the trail viewpoints created and the widening of the vegetative corridor by approximately 50% (due to streamside planting), which enhanced natural views and increased wildlife habitat.

Recently, a second trail has been created, which runs perpendicular to the restored stream area. This trail benefits from a unique view of the creek and the farmland.

Additionally, Parks staff stated that the biggest benefit may have been the project's value as a learning experience. "At the time (1999–2000) it was ground breaking," noted Gerald Fleming, Park Planning & Design Manager. "There has been a significant change in how the community looks at wetlands and streams in that time. Blenkinsop was an early effort to show that it should be possible, over time, to create the on-site conditions for a properly

functioning stream. The simple idea of slowing down the flow of water has been applied to a number of development scenarios – permeable paving surfaces, bio-swales, and other similar methods are now seen as being more environmentally friendly and are being used on a broader basis by the development/construction industry.”

In Fleming’s view, the Blenkinsop project provided a model for how things could be done differently. “It has contributed to new thinking that has been incorporated in Saanich, and elsewhere, on how to deal with stormwater and development issues. Most communities now have examples of these techniques, and design details and specifications are being changed.”

Taxes

This project lies within private lands, so there were no direct tax implications from doing the work, except that the municipality paid for a significant portion of the work out of its policy and commitment to stream rehabilitation within municipal bounds.

However, as subsequent heavy winter rains in 2001 and 2006–07 showed, the new wetland has sheltered the community from potentially significant flood damage. This short stretch of stream and associated ponds are now capable of absorbing a significant amount of flood water, filtering it, and directing it downstream, limiting damage to neighbouring residential, commercial, and public properties, including roadways.

Landowner Costs/ Benefits

There was no immediate financial cost to the landowner; all costs were borne by project team members (see **Project Funding** above). However, during construction in the peak producing summer months, 4–5 acres of land were effectively out of production while work was being done to relocate creek. The landowner is emphatic that the benefits far outweighed this period of lost productivity.

Benefits related to the farm itself include:

- Increased workable land (net gain of 2–3 acres), despite the fact that what had been a 10 ft. wide ditch (including allowance on either side) became a 50 ft. wide stream. The landowner cannot put a dollar value on this benefit (based on acres of land/\$ value production) because current agricultural economics in Canada raise questions about any valuation of agricultural land.
- Better access to land near/under power pylons. The landowner is now able to work these pieces of land. In total, cultivable lands increased by up to an estimated 7% (3–4 acres).
- Less cost for waterway maintenance. Ditches require maintenance to function properly (municipal staff estimate clean-out is required every 4–5 years); streams require much less (staff estimate clean-out is required every 10–15 years).

- A more efficient field (elimination of duplicate irrigation equipment & duplicate road maintenance as well as easier access to the entire field).
- A more attractive field. Moving and transforming the ditch into a stream created a natural, vegetative buffer/screen that encloses one side of the field and blocks the view of less visually appealing neighbouring lands/features. The landowner said that this is very significant because the farm's agri-tourism activity may be a growth opportunity for the farm business. Having an attractive farm is an important element in appealing to tourists, and the new stream is an attractive feature.

As well, the Lochside Trail linkage offers a number of benefits:

- It eliminated trespassing and vandalism (estimated cost in excess of \$100,000/year) due to poor public access to the existing trail network. Initial landowner concern about giving more people access to the land (perceived cost of vandalism, etc) dissolved because, as predicted by the research (which the landowner had been somewhat sceptical about), making an unofficial trail into an official trail means that more people use it. Instead of more bottles and debris from rural 'road parties' there are less. "Too many people for trouble to happen" was the landowner's assessment.

- It allows the public to view a working farm. This is a good thing from the landowner's perspective, given her interest in public education about agricultural activity. "It's good to have people looking at what we're doing and it builds goodwill between the farmer and the public."
- It resolved an historic conflict between cyclists and farm vehicles on the property (conflict between farm roads/through ways designated as public cycle paths). The new stream placement and trail ensures cyclists and hikers remain on the trail, not on farm roads.

From a flooding perspective the stream relocation project has proven its worth over the past winter:

- The 2006–07 winter rains were among the heaviest the landowner had seen in 40 years, with extensive flooding of the Blenkinsop wetlands and lake. The 50ft stream bed had become a '50–60 ft. wide river' within a foot or so of going over the berm/trail. "A very deep water!" in Mrs. Galey's words.
- Damage from the flooding was significant. Approximately 60% of the strawberries were lost, and there was some structural damage to driveways, roadways. However, Mrs. Galey suggests that with only the ditch, the flooding of the fields would have been worse, with far more damage to the farm berry plants, including raspberries, which appear (in

early Spring 2007) to have weathered the flood. In her view they would have lost all the strawberry plants.

- The landowner noted the efficiency of the new stream system. The water moved quickly off the land, more quickly than the previous ditch would have accommodated. This is believed to have kept basements (in neighbouring properties) dry.

In short, the landowner is emphatic that the stream relocation “is an absolute benefit to the farm.”

■ OTHER OUTCOMES

Improved Water Quality/ Flood Management

The creek system, specifically the settling pond and natural vegetation-filtration functions, are helping to clean the water flowing into Swan Lake. Water quality samples were taken prior to stream work and again during the project as part of graduate research by Lehna Malmkvist. Recent samples (2006) have been taken by Aqua-Tex. Since most of the historic data were gathered during the summer months, and the 2007 summer samples have not yet been taken, it is too early to determine whether there has been a substantial change in water quality.

The immediate neighbourhood now has an effective stormwater / flood management system.

Economic Impact for Community

The Galey Bros. Farm lands contain only a portion of the length of Blenkinsop Creek. Nevertheless, the additional viewing stations (with vistas of the working farm as well as the now well-established bird habitat) are seen as a benefit to recreation. It is not clear what the economic value of this contribution is, but Judy Galey’s comments about increasing reliance on agri-tourism are a signal. It may be appropriate to begin to measure linkages between ‘green’, or ‘prettier’ as Mrs. Galey put it, viewsapes and other, more traditional tourism indicators.

Ecological Values

Anecdotal reports by local residents indicate that bird life and activity has increased subsequent to the stream rehabilitation. This has led to a decline in insecticide use in neighbouring properties as insect-eating birds have moved into the restored creek-side habitat.

Large fish returns have increased from a zero count in 1987 to a 2006 count of 100 pairs of mating salmon. Former District Deputy Engineer Rick Lloyd emphasizes that, “any and all stream rehab successes in the municipality are the result of many players, many community leaders — Council, receptive developers, Scouts, Patrick Lucey and Cori Barraclough (Aqua-Tex), and stream keeper organizations, to name a few.”

Social Capital

Local Scouts helped with plantings and school groups use the site for outdoor education purposes.

As noted earlier, the creation of a properly functioning stream environment greatly increased visits by users of the Lochside Trail system. The public are able to view farming activities from outlooks without trespassing. The volume of trail users also has eliminated vandalism occurrences that were very problematic before the restoration was completed.

The trail and habitat, and adjacent parklands, provide ongoing locations for community and educational activities.

Impact on Subsequent Developments

The District of Saanich was already identified as being in the forefront of municipalities making policy and acting towards greater stewardship of waterways within their jurisdiction. Nevertheless, the municipal engineer involved with this project (no longer with the District), as well as the Parks staff, expressed the view that this (and the Willowbrook/Swan Creek project) have had further influence on how the municipality treats streams and wetlands.

Maintenance / Managing Invasive Species

The landowner was concerned that having a stream to maintain would be an added cost. Not only would invasive-species control be heavier, but a natural-type stream was assumed to require complicated adherence to regulatory protocols.

Almost six full years after the project's completion, however, the landowner's experience is that there is less maintenance required by the new stream than was demanded by the previous ditch.

Nevertheless, maintenance of natural-type stream situations remains a thorny issue. This is especially the case with the greatest issue, invasive species, primarily blackberry. Typical ditch maintenance involves industrial solutions – excavation/dredging and/or mowing with machinery. A natural-type stream/wetland does not allow this solution.

As the consultant has noted, construction of natural-type streams creates optimum conditions for invasive species. Disturbed soils, inappropriate industrial treatments, planting regimes and requirements of natural functioning systems, as well as communication/ training issues for maintenance personnel all need to be addressed. The consultant believes these issues, while significant, are part of the learning required when using new technologies, approaches, and systems.

Possible solutions include:

- planting the site immediately
- using the largest affordable plants & trees, even it means using fewer of them
- prioritization of irrigation to secure planting success

- heavy mulching of planting (this will maintain moisture in the soil and inhibit weed species)
- making ‘clear out the wetlands’ part of standard operating/maintenance procedures
- appropriate training for maintenance staff, and
- continuity among consultants, staff involved in project construction, and staff involved in project maintenance.

■ PROFICIENCY / EXPERTISE

The consultant describes those involved in this project as being ‘first rate’ in terms of proficiency and willingness to learn.

Municipal Staff

Stream ecology training is specialized, and typically not part of municipal staff training programs. Any significant stream work, especially if it involves private lands, involves a steep learning curve for staff.

As well, there are often tensions or differences between municipal staff goals and developer/landowner goals. One landowner noted that it would pay staff to be sensitive to financial (and other factors) that play a role in a landowner’s ability or willingness to meet municipal requests, or even to participate in a project.

As noted elsewhere, ‘green’ technologies and approaches are still unconventional, and require a willingness to experiment. The consultant suggests that a way to grow expertise and competency at a local level is to initiate or support small projects. This permits experimentation and education, and incremental change at a manageable (from a risk perspective) pace. It has the additional benefit of demonstrating to other jurisdictions some of the costs and benefits of particular approaches.

The relative novelty of these technologies, and the limited training in stream ecology, puts municipal staff in a difficult position. Staff are charged with protecting the community interest and being mindful of any and all potential liability issues. New approaches require a willingness to risk and to trust. Even if they are supportive of the goals of a project, their lack of knowledge and the largely site-specific application of natural systems approaches means they either trust the consultant, or they don’t. As a result of the relationship built through other projects, staff and Council knew the consultant. Therefore the municipality was willing to support the consultants and their vision for the project, which was, in effect, the creation of a natural-style Blenkinsop Creek stream.

Professionals / Consultants

Those involved with the project were highly appreciative of Patrick Lucey’s leadership and the skills of the Aqua-Tex team. The work described in these projects has been referred to as “ground

breaking & innovative”, and — after several years of experience with the practical side of natural-type streams as part of a stormwater management regime — successful.

Those interviewed credited Lucey and Cori Barraclough with the skills and patience to work within the limits of historically insensitive (from a fresh water perspective) policies, practices, and bureaucracy, a willingness to experiment, and the ability to develop trust & goodwill, as well as collaborations that have led to important results for landowners, the municipality and the community.

Contractors / Builders

The excavation and construction contractor was identified through an earlier project on an adjacent property. That experience (rehabilitating a wetland) encouraged the contractor to invest in specialized excavation equipment (long-boom, vegetable-based hydraulics) and to actively pursue sensitive habitat work. The same contractor was also part of the subsequent Willowbrook Subdivision/Swan Creek Restoration project.

■ **LEARNINGS**

All involved were enthusiastic about the outcomes of the Blenkinsop Creek project. Working on the project with the consultant has, in Judy Galey’s words, changed how they look at and are working with the land. “Just being around Patrick and Cori has had a positive educational value, inestimable... We were already using Integrated Pest Management... Ray has let his spray license lapse ...[and] has no plans to renew it.”

Most persons interviewed did, however, acknowledge ‘opportunities for learning’ from the process such as recognizing the importance of taking core samples to determine geological conditions underlying soils.

Suggested strategies in meeting some of the challenges of effective stream work include:

- Start small and develop skills and expertise on a manageable scale before taking on larger projects
- Create a plan at the beginning of projects
- Incrementally improve the plan. Do not abandon the plan. Difficult goals are reached in incremental steps, all the while keeping an eye on the goal.

Finally, it was suggested that one of the keys to success of this project was the broad support it enjoyed from all involved – from the landowner, Council, the public, as well as the consultants and the contractors.

■ CONTACT INFORMATION

Patrick Lucey and Cori Barraclough
Aqua-Tex Scientific Consulting Ltd.
Tel: 250-427-0260

■ REFERENCES

Project Team

- Galey Bros. Farm, Ray & Judy Galey (landowner, farmers)
250-721-1948 (www.galeyfarms.com)
- Aqua-Tex Scientific Consulting, Patrick Lucey
& Cori Barraclough
250- 427-0260
- District of Saanich, Gerald Fleming (Park Planning & Design
Manager, 250-475-5532), Rick Lloyd, (Deputy Engineer with
District of Saanich at time of project, now with
RCL Consulting, 250-477-7003)

- Swell Environmental Consulting — Lehna Malmkvist (Registered
Professional Biologist; Natural Science & Engineering Research
Council [NSERC] researcher during project)
250-598-7947 (www.swell.ca)
- LaCas Consultants Inc., Professional Engineers and Hydrologists
based in Vancouver, BC. Brian LaCas (hydrologist),
Suite 200 – 1311 Howe St., Vancouver, BC V6Z 2P3
604-688-2535 / cel: 604-816-8015
- Joseph Brown Contracting, Joseph Brown (excavation,
construction), 960 Ferncliffe, Victoria, BC V9C 3X9
250-888-5199
- Capital Regional District — Forestry Division
- Eco-Action 2000
- E-Team (BC Ministry of Environment)
- Katimavik
- Pacific Christian Academy
- Royal Oak Burial Park
- Royal Colwood Golf and Country Club
- St. Michael’s University School
- South Island Aquatic Stewardship Society
- Swan Lake Christmas Hill Nature Sanctuary, Board of Directors
- University of Victoria
- Victoria Natural History Society
- Victoria Geomatics

■ ADDITIONAL RELATED MATERIALS

[1] Proper Functioning Condition (PFC)

PFC is a methodology for assessing the physical functioning of riparian and wetland areas. The term PFC is used to describe both the **assessment** process, and the on-the-ground **condition** of a riparian-wetland area.

The PFC **assessment** provides a consistent approach for assessing the physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. The PFC assessment synthesizes information that is foundational to determining the overall health of a riparian-wetland area. The PFC on-the ground **condition** refers to *how well* the physical processes are functioning. PFC is a state of resiliency that will allow a riparian-wetland system to hold together during a 25 to 30 year flow event, sustaining that system's ability to maintain both physical and biological attributes.

For further information about PFC refer to (www.mountainvisions.com/Aurora/pfc.html)

[2] Malmkvist, L. *Smart Municipal Development: Urban stream restoration and stormwater management in residential and agricultural development areas in Saanich, BC*, (Masters of Science thesis, University of Victoria, 2002).

Green Value Strategies on Vancouver Island

PROJECT TITLE:

Hawthorne Community

■ OVERVIEW

The Hawthorne project is a 230 house suburban neighbourhood development in the City of Nanaimo, straddling a rocky outcrop between two wetlands, Buttertubs Marsh to the north and Cat Creek to the south.

This was one of the largest developments in the City – 230 homes is approximately half of the City’s annual new home production (current growth is approximately 500 families per year). It is located adjacent to the Harewood neighbourhood (an older, inner city area), and the Malaspina University-College neighbourhood.

The developer’s proposal uses elements from the Silver Maples project in Maple Ridge. That project won a Gold Georgie Award (2006) for its natural landscaping and neighbourhood design features. The Hawthorne project is focussed on:

- a ‘friendly’ pedestrian-oriented neighbourhood design
- mixed densities
- mixed-use commercial/ residential ‘village’
- a rainwater management system that reduces flooding into neighbouring wetlands and helps to clean the water that is discharged.

InSight Group Development Corporation, through architect and General Manager, Doug Bromage, has been developing land and building houses in the greater Nanaimo area for almost 15 years. He is interested in earning a reputation for environmentally responsible construction, sensitivity to urban form and natural amenities, and being ahead of market demand. Mr. Bromage is willing to take the time and risk that new approaches require, and therefore sought out a landscape architecture firm (Lanarc Consultants Ltd.) with a reputation for environmental responsibility and innovation. He acknowledges the sometimes slow process of negotiation and compromise with municipal staff when dealing with new approaches and technologies. From his point of view, staff are charged with protecting civic and community resources; new approaches raise considerable education, knowledge, and liability issues for staff, and require the developer to be willing to compromise.

On a more general note, Mr. Bromage expresses a concern that without adequate densification of the existing urban footprint, a larger context will be lost. “The next 10-15 years are going to see a big challenge on the Island,” he says. “Urban containment is critical. The challenge will be for municipalities to push for density of developments.”

There is, therefore, some irony in the fact that Hawthorne is less dense than the original zoning allowed. This is mitigated to some extent by the inclusion of secondary suites, mixed-use commercial/ rental, and smaller lots and houses in select areas of the site. Generally, Hawthorne trades a conventional suburban development layout for one that mixes housing types and densities, allows for greater open and green spaces, and introduces new rainwater management technologies. The developer realizes higher design and property values and the community gains a number of amenities.

PROJECT HIGHLIGHTS

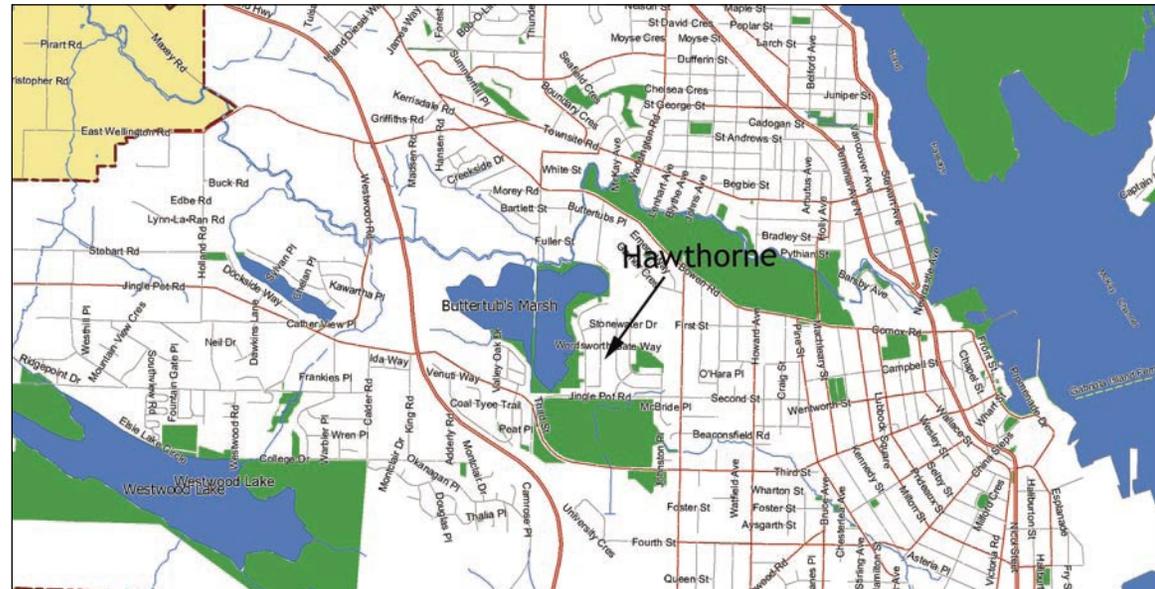
Location

1400 Jingle Pot Road
Nanaimo, BC
Vancouver Island

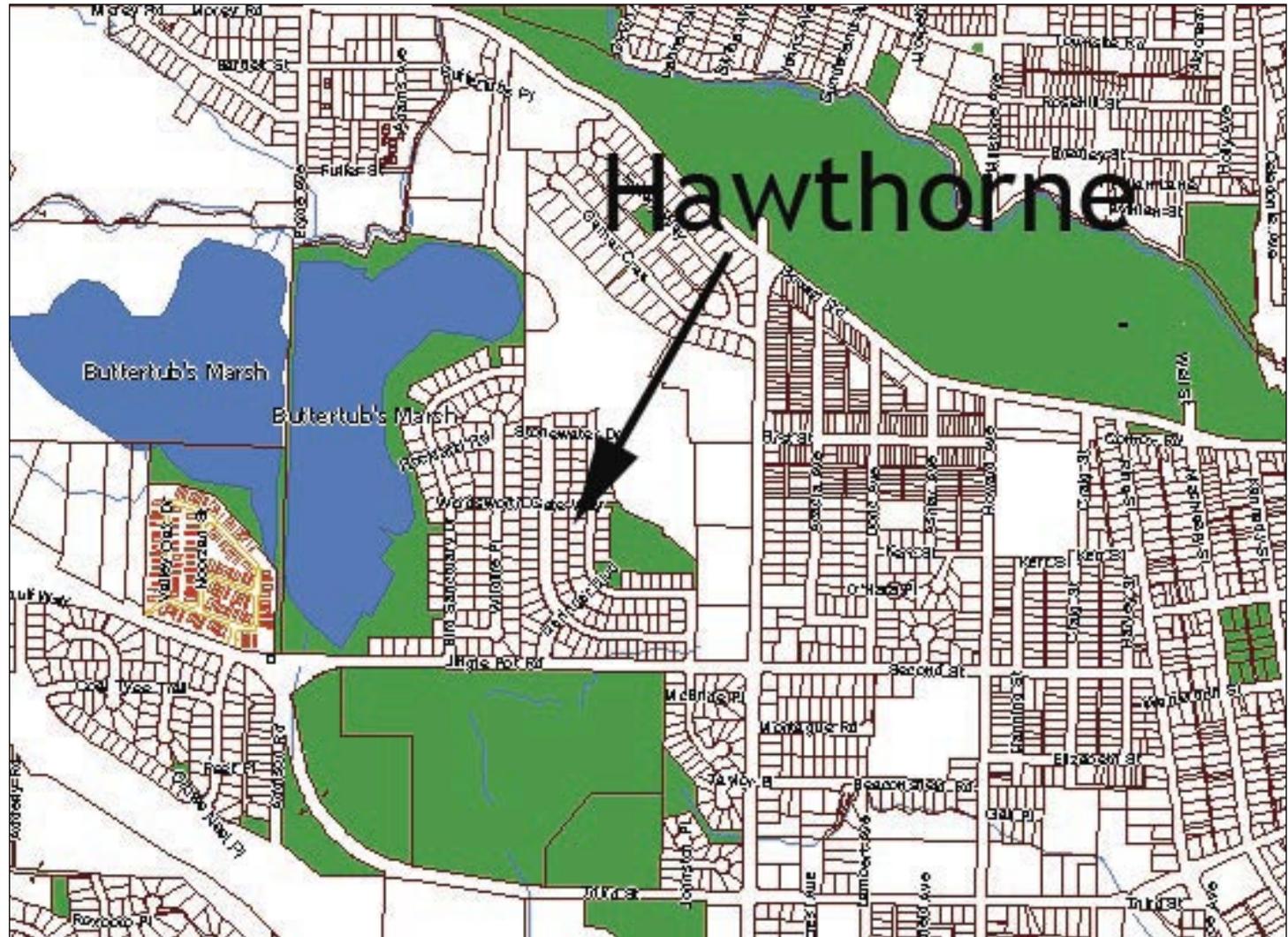
Landowner/ Developer

InSight Group Development Corporation
General Manager: Doug Bromage

Hawthorne site
in Nanaimo.



Detailed
subdivision
layout



Challenge / Reason for Project

Building a large development on a rocky knoll required an innovative approach to rainwater management given that any flows off roofs and roads and other impervious surfaces would have an impact on adjacent Buttertubs Marsh and Cat Creek wetlands. One concern was flooding; another was water quality. The City required that the developer not exceed previous discharge levels and the developer and design team wanted to avoid the expense and restrictions (given the rocky site) that a conventional piped rainwater management system would have entailed.

Proposed Solution

Using the 'water balance' model (www.waterbalance.ca), the design team created a groundwater recharge system using natural and built retention technologies to absorb or delay water discharge.

Start Date

The development process, including re-zonings and approval requests, started in 2005. Construction on the first phases of the project began very late in 2005.

The public process for re-zoning of subsequent phases has taken place over the past two years; the most recent of five meetings was held in March 2007.

Completion Date

It is anticipated that build out to 230 houses will be completed by 2009.

■ CONTEXT

Social/ Economic Context

While the development is on a greenfield site, the project is described as urban infill in a suburban context. An older, low income neighbourhood (Harewood) lies to the north, and the newer Malaspina University-College neighbourhood lies to the south. The developer indicated that the down-market location (next to Harewood) may have been a deterrent to other developers/ builders. This would explain why the property was viewed as an 'affordable' development opportunity within the City. Because of its size and situation, and because of the neighbourhood design features, the developer believes Hawthorne will be the defining element in its immediate neighbourhood.

Neighbourhood Concerns

Previous zoning allowed for higher densities. Initial neighbourhood meetings identified some fear of medium density, multi-family development, which had been proposed for the site in the past. Because the developer was interested in a qualitatively different type of development than the conventional zoning allowed, maximum density was not the objective. “Where there is some density,” he notes, as in the mixed-use commercial ‘village’, “locals were very supportive.”

Governance/ Regulatory Issues

The developer has worked in the greater Nanaimo area for a number of years on various projects, most of them infill. Most large projects have involved the City of Nanaimo, and although he cites the challenges of working with ‘motherhood engineering values’, he is also quick to point out that the opportunity to do new things in terms of infrastructure and environmental amenities has come via the City. In terms of the successes InSight has experienced, Mr. Bromage has kudos for City staff, considering them ‘part of the team’.

“Most bureaucrats want to have a successful community, but they’re fighting the lowest common denominator.”

Introducing new approaches, perhaps new technologies, ‘higher’ environmental standards — it all takes time, extensive

negotiation, and compromise. The developer gave up some design features at Hawthorne; for example, street size, scale, and lane construction/ form were altered. At the same time, reduction on front yard setback helped to ‘tighten’ the development as per InSight’s vision.

The developer opines that there is a necessary education process if his company is to continue to develop residential projects that anticipate rather than follow the market. There is also the element of trust that allows for City staff and the developer to make compromises and take risks. The developer’s attitude is “Don’t fight city hall. They get paid on Friday whether they work with me or not. I only get paid when my project gets to market.”

How to respond to City concerns? “We sit down with the engineers,” Bromage says. “If we don’t agree with their position, we look at proving to them that there is no net cost to the community. Change takes time,” he continues. “What is the advantage to the bureaucrat who sticks their neck out? City Hall is part of our ‘team’. We want them to grow with how we do things. Nanaimo City staff have been very good overall, and we [InSight] are seeing some changes [in the City’s way of doing things, their acceptance of new ideas]. Nanaimo is a good place. The tools are here. We just need to refine. There are issues wherever you are.”

■ SITE CHARACTERISTICS

Soils

The site contains a rocky outcrop with light surface soils.

Environmental Issues

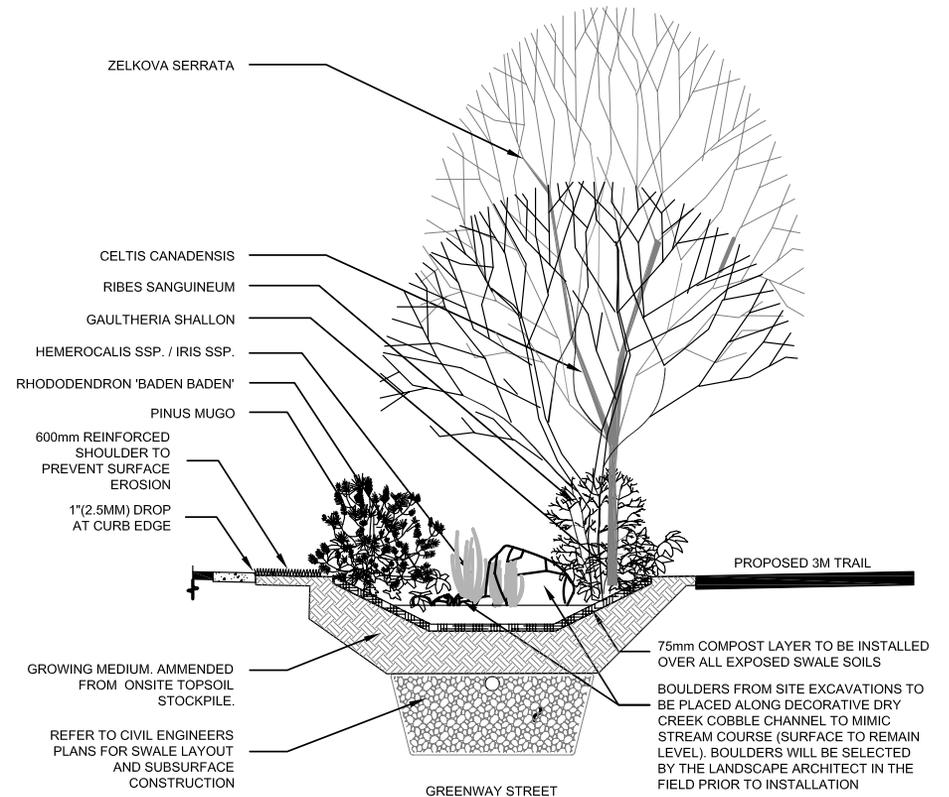
Environmental concerns include potential flooding of adjacent wetland areas and discharge of poor quality stormwater runoff from impervious surfaces (roofs, roadways, driveways).

■ ECOLOGICAL / URBAN DEVELOPMENT METHODS

Ecological Development Methods

A previous 'wet spot' at the top of the knoll was turned into a pond over a bed of broken/crushed rock (the underlying rock has been blasted and broken to form the bed).

A deeper layer of top soil has been added on all grassy and planted surfaces to increase absorbency. Top soil depth is a key infiltration factor in new development. Increasing absorbent material has a significant impact on storm water regulation during the wet season and irrigation/conservation of water during the dry season.



TYPICAL SWALE SECTION (REFERENCE)

Not to Scale

Section / Elevation

GRAPHIC COURTESY OF LANARC CONSULTANTS LTD.

The roads are narrower than is typical in a subdivision of this type (reflective of the City's general trend toward smaller road cross sections). Curbless streets are designed with bioswales. Water collects and infiltrates into absorbent soils; when soils are saturated the swale includes freeboard to accommodate additional water storage.

In areas where gradients are steeper concrete weirs are incorporated to reduce flow rates and minimize potential erosion. During extreme storm events flood flows are handled through a more traditional stormwater system. A system of subsurface rock pits and infiltration galleries has been incorporated, leading from the site into downstream wetlands.

Finally, due to requirements for infiltration, there are no small lots immediately next to the Buttertubs Marsh area.

Urban Development Features

A variety of features including narrower roads, more street trees, human-scale street proportions, pedestrian circulation, links to the citywide trail network, downtown infill, proximity to schools and recreational/ sporting facilities, and access to commercial services create a pedestrian friendly environment.

Sociability and neighbourliness is promoted through emphasizing front porch construction, and de-emphasizing garages (some are detached while others are hidden from street view). In general the development feels more open.



HANS PETER MEYER



HANS PETER MEYER

Infiltration gallery before planting (above). Street view of Hawthorne development (below).

The neighbourhood design includes:

- mixed densities: single family homes, multi-family, rentals, mixed use
- mixed lot sizes: smaller lots provide density and (relative) affordability; larger lots act as a buffer (and provide absorbency) next to the sensitive Buttertubs Marsh area
- mixed house sizes: smaller houses with a smaller footprint/ impact on the land, as well as larger houses, 50% of which include secondary suites, thus providing affordability to the buyer while at the same time providing sensitive 'densification' and affordable rental units
- mixed use 'village': for example, rentals, live/work, café , thus creating a commercial walking destination for residents.

Finally, the commercial 'village' will include 65 residential units at ©.600 ft², 10 retail units at ©.600 ft², 3–4 larger commercial units (2000 ft²), and a café (already zoned for a neighbourhood pub which likely will have a 'food primary' license and be more family oriented as the surrounding neighbourhood is a high-use sports/ recreational area).

■ COST / BENEFIT ANALYSIS

Municipal Costs/ Benefits

Municipal staff is generally enthusiastic about the principles and values expressed in the Hawthorne project. Their version of the process involved in the development of Hawthorne generally concurs with that of the developer's. For the most part, both parties described a solution oriented rather than conflict oriented relationship.

Concerns expressed by staff have more to do with the appropriateness of this site (primarily a rocky knoll between two wetlands) for the innovative rainwater management technologies used. They are still concerned about the hydrological changes that road construction and site development may have created. They remain sceptical about the appropriateness of this site for what they nevertheless believe are useful and innovative ground water recharge technologies.

Infrastructure Benefits

Infrastructure benefits include a generous park contribution, including a pond and increased pond habitat. A trail through the development connects to the municipality's 'alternative transportation' routes, linking downtown, university-college, and regional recreational facilities. In addition, this trail is also part of the Trans-Canada Trail.



Engineered retention pond at Hawthorne.

Maintenance Costs

The City of Nanaimo Parks Department is concerned that Hawthorne may require higher standards of maintenance than typical single family subdivisions within the municipality. This raises issues around equity of service to residents and cost of maintenance.

In order to meet municipal concerns about higher than normal standards of parks/roadway maintenance the developer may be involved in some maintenance (i.e. irrigation) of planted

areas longer than is typical for this type of development. The design team is confident that the deeper soils and consequent higher absorbency of planted areas should result in lower long-term irrigation costs once plantings are established. The City and developer are currently negotiating an agreement that would see the developer and residents take responsibility for higher-maintenance features (i.e. bio-swale, planted medians and roundabouts). The developer has indicated willingness to underwrite the cost of maintenance for the initial two years to allow plantings to be established. In the absence of such an agreement the City may simplify the median and roundabout plantings.

City staff also has reservations about the long-term impact of certain rainwater management features on the road bed. Citing the possible erosive effect of spillover from the subsurface rock pits, they wonder if the City won't be left fixing the road in 10–15 years. (This concern has led them to suggest similar technologies but with modifications in a subsequent development.)

Economic Impact for Landowner/ Developer

In assessing the costs of building Hawthorne with proposed 'green' and urban neighbourhood design the developer noted that there is a premium of approximately 15-20% upfront. "This is the cost of additional time to work with municipal staff to go through a longer approvals process, and the fact that more consultants are needed for this kind of project."

Civic staff acknowledge that approvals for Hawthorne took longer because so many features were outside the standard review process.

On the benefit side, the developer believes that these costs are worth it because, “at the end of the day we’ll save because we’ll sell quicker.” He also sees that his product will increase in market value over time as the design features are appreciated (see note below on increased value of lots, compared to average increases). The projected value of lots and houses is such that the developer gave up approximately 50+ lots that the land would have yielded with conventional zoning and construction. “This was ‘maxing out’ the land. InSight pursued a better, more ‘valuable’ project using less lots. In this case, ‘less is more’ — more value. The place [neighbourhood, community, local environment] is better off.”

Risk - Value - Return

The developer describes his philosophy as ‘doing the best we can at the time we are doing it.’ He believes that using new approaches to land use planning, neighbourhood design, and environmental planning is a requirement for long term success. “At the end of the day it gives us market advantage. We want to be ahead of the curve. We are always going to be pushing the envelope. There is no point [from the perspective of wanting to anticipate the market] in doing what was done yesterday.”

Risk of Green vs. Conventional Development / Building Strategies

For the developer, the risk of not going green, and of not incorporating urban neighbourhood design features is the risk of falling behind the market. On the selling side, Dan Grondin, the listing real estate agent, believes that because the green features are not readily apparent, Hawthorne appears to be a conventional development, except that it has more open space and has a ‘friendlier’ feel.

However, both the developer and the real estate agent expressed pride in being involved with Hawthorne. Mr. Bromage sees it as another example of how his company is taking a leadership role in changing how development is seen in the community — and being vindicated by strong market response. Hawthorne is one in a series of projects that have played a mutually (i.e. for both the developer and municipality) educative role in the Nanaimo region over the past dozen years.

Marketability

The listing real estate agent said that Hawthorne is marketed as a conventional neighbourhood development. The green features are largely ‘hidden’ and not immediately visible to prospective buyers. At present they are not a significant marketing feature.

Mr. Grondin stressed, however, that two features distinguish Hawthorne from conventional, newly constructed developments, and that buyers are expressing their interest in these features. They like the neighbourhood design and the fact that the slightly smaller houses and lots mean that they are more affordable than other new houses being built in Nanaimo. They also appreciate the fact that it is a short drive, easy cycle, or 15 minute walk to downtown and/or university-college and that they are surrounded by schools, playing fields, recreational opportunities, and green space.

Property Values

The value of raw lots at Hawthorne has increased significantly in comparison to other city lots. The Vancouver Island Real Estate Board reports that the value of lots in the City of Nanaimo rose by 58% on average. The value of lots in the Hawthorne project saw an increase of approximately 117% in that same time (2005 valuation of lots = \$60,000; 2007 valuation/appraisal = \$130,000). InSight interprets this rise in value as strong market endorsement of their urban design and green development product. In three words, "People are keen."

Overall, these valuation increases suggest that the developer has successfully anticipated an emerging market. The features of Hawthorne will, in his view, become the norm. To build anything more 'conventional' would be risky. He believes that even a slower market will be more responsive to the kinds of green and neighbourhood design features in Hawthorne than

in a conventional development. If the market becomes more savvy to the green elements that are currently hidden features of Hawthorne, these should become valuable features in the marketing of re-sales.

Affordability

Hawthorne is attracting a demographically diverse group of buyers. Some are elderly (as old as 80), but many are new families and first time home buyers. The real estate agent suggests that Hawthorne is creating a more mixed neighbourhood than is typical in a new development.

Positive market response to Hawthorne means that lots and single family homes are moving out of the affordable range. A number of other features, however, may help to mitigate the expense of living in the development. These include: rental units in mixed-use complexes, pedestrian-friendly features, linkages to alternative-to-auto transportation, smaller lots and smaller houses, and secondary suites in at least 50% of larger single family dwellings.

Sales / Rentals

The first residential MLS listings were submitted in Jan 2006, with approximately 45 homes sold by March 2007. Because construction of the commercial/residential village started in late Spring 2007 the developer hasn't done any pre-rentals. "We would be flooded if we opened up for pre-rentals."

Green Leverage

No leverage was gained by having green features due to the increased length of the approvals process. Additionally, the property does not meet maximum densities allowed. The developer pursued alternative rainwater management, roadways, green spaces, and neighbourhood design features that required more open space with fewer buildings. He has, however, applied for zoning to allow a commercial/residential 'village' and some small lots/higher densities in portions of the site.

■ OTHER OUTCOMES

Ecological Values

The Hawthorne development is enhancing basic resources, i.e. water, air, etc., qualities that other economic activities depend on, and ensuring that cleaner water is being discharged into neighbourhood wetlands.

Mr. Bromage expressed an interest in creating a 'green' feel to the neighbourhood being built.

Social Capital

Hawthorne is providing linkage to both the local alternative transportation trail network and the Trans-Canada trail.

It is creating affordable rental housing through 'soft' and/or 'sensitive' mixing of demographics and incomes and demonstrating a model of neighbourhood design that emphasizes 'friendly' features such as narrower streets, front porches (combined with de-emphasis of garages), mixed densities/uses/housing types, and public open spaces.

Finally, it will likely create opportunities for new businesses and employment (potentially supported by the new neighbourhood population) in the mixed-use village.

Impact on Subsequent Developments

City staff cited two subsequent projects within the municipality that are incorporating elements first used at Hawthorne. These sites are, in staff's view, geologically more amenable to the Hawthorne innovations. A third, large development is being considered for a comprehensive rainwater management plan. It is City staff's view that this third site will benefit directly from what has been tried and learned at Hawthorne.

■ PROFICIENCIES / EXPERTISE

Municipal Staff

Municipal staff, and inspectors and regulatory officials at all levels need to be both knowledgeable about new technologies/ techniques AND trained in how to properly inspect them.

Unfamiliarity may result, as it did at Hawthorne, in some missed opportunities. Staff readily acknowledged that this was a learning process for them, and given the novelty (in the region) of some of the proposed technologies and approaches, they did not always have the knowledge to properly assess certain features.

Professionals / Consultants

The design team is active and experienced in promoting and developing alternative models of rainwater management and subdivision design. They are considered to be leaders in the region with regard to planning and implementation of these systems. It is their reputation that prompted the developer to engage them on this site.

Contractors

For this type of landscape treatment to function properly (i.e. “absorbent landscape,” seeding, paths, etc) trades people need to be trained /experienced to the required standard. Substandard trades, technical, and professional work means the landscape and/or other systems don’t function as designed/intended). The

required level of experience and competence were not readily available. Issues cited during construction included soils being too heavily compacted (reducing required absorbency), and lack of appropriate technical skills in dealing with absorbency issues on a rocky site.

■ LEARNINGS

City staff is generally enthusiastic about many of the elements of the project, although some departments remain critical of the decision to use these elements on this particular site. As one staff member put it, “You need to break eggs to make an omelette. Hawthorne is a broken egg.”

City staff also identified the design team and developer as “idea people years ahead of the contractors and professionals” involved. The technologies required for success demand a level of ‘finesse’ and knowledge among technicians and contractors that isn’t yet readily available in the region.

Some of what the design team and developer proposed is being implemented or encouraged by the City in other projects, on sites that staff see as more geologically suitable. Given the experience of Hawthorne, one can assume that these will be ‘omelettes’!

All individuals interviewed emphasized the learning process this project entailed. In some cases, acknowledging either their own limited experience in this type of development, or expressing a patience and persistence in working towards deeper mutual understanding of the potential of using the proposed methods and technologies. The developer is committed to building 'greener' projects, and knows that this means taking the time to meet the concerns of municipal staff who face liability and professional issues. Education of and by all parties is one of the givens for projects of this nature.

■ PROJECT REFERENCES

- Doug Bromage (architect/general manager/landowner), InSight Group Development Corporation
tel: 250-756-0119 (www.InSightcommunities.ca)
- Doug Backhouse (landscape architect, part of project consultant team), Lanarc
tel: 250-754-5651 (www.lanarc.ca)
- Dean Mousseau and Rick Grant (Planning & Engineering), Richard Harding (Parks), City of Nanaimo
tel: 250-754-4251 (www.cityofnanaimo.com)
- Mark Warbrick, Newcastle Engineering
tel: 250-756-9553
- Martin Jarman, EBA Engineering Consultants Ltd. (Geotechnical)
tel: 250-756-2256 (www.eba.ca)
- Dan Grondin, Royal LePage Nanaimo Realty
tel: 250-760-1066 (www.royallepagenanaimo.ca)

■ ADDITIONAL RELATED RESOURCES

Water Balance Model (www.waterbalance.ca)

Green Value Strategies on Vancouver Island

PROJECT TITLE:

Westhills, City of Langford

■ OVERVIEW

Westhills is an ambitious residential development planned for a greenfield site in the City of Langford. Under the 15 year leadership of Mayor Stewart Young, the City has established a reputation for being assertive in identifying the kinds of development that are desirable for Langford, and in working with landowners, builders, and developers to meet these needs. Westhills is an example of the Mayor's determination and the City's leadership in encouraging new forms of development.

Impressed with green developments and proposals he'd seen elsewhere, Mayor Young wanted to see the green development model used for greenfield sites in Langford. The Westhills site suggested such an opportunity.

Located across Langford Lake from Langford's town centre, the site was originally two separate properties, owned by two long-time Langford families. Both properties had been eyed as development opportunities, but Mayor Young wanted to see a development built to the highest 'green' standards possible. He felt that this might be possible with a larger, more comprehensive development if both parcels were developed together; he therefore approached both the landowning families and asked them to consider working together. The goal was to create what would become a Leadership in Energy and Environmental Design



Westhills from the air.

(LEED) inspired neighbourhood development (LEED-ND). The two families responded positively. One landowner bought out the other, and the Westhills Development Corporation was formed.

The new Westhills entity took the Mayor's vision and began to move ahead with it. Although very interested in a 'smart growth' type of neighbourhood design, the Westhills team was not initially sold on the green building component. While working towards LEED certification, however, the development team

Public support for the Westhills initiative has been strong. Initial concerns aired about the proximity of a commercial centre/buildings to the shore of Langford Lake, possible impact on adjacent neighbourhoods and views from across the lake have been addressed. Local media have described public meetings as a ‘love in’ between residents, the developer, and Council.

Westhills is a significant project on Vancouver Island, indeed within Canada and North America. The key to its unfolding, for all interviewed, is Mayor Young’s enthusiasm and leadership. His strong support for a green development on the site has certainly been instrumental in the developer’s commitment to ‘going green’. It is described as having given the Westhills team a sense of partnership with the City of Langford, thus mitigating some of the risks of taking on one of the first LEED-ND projects in Canada.

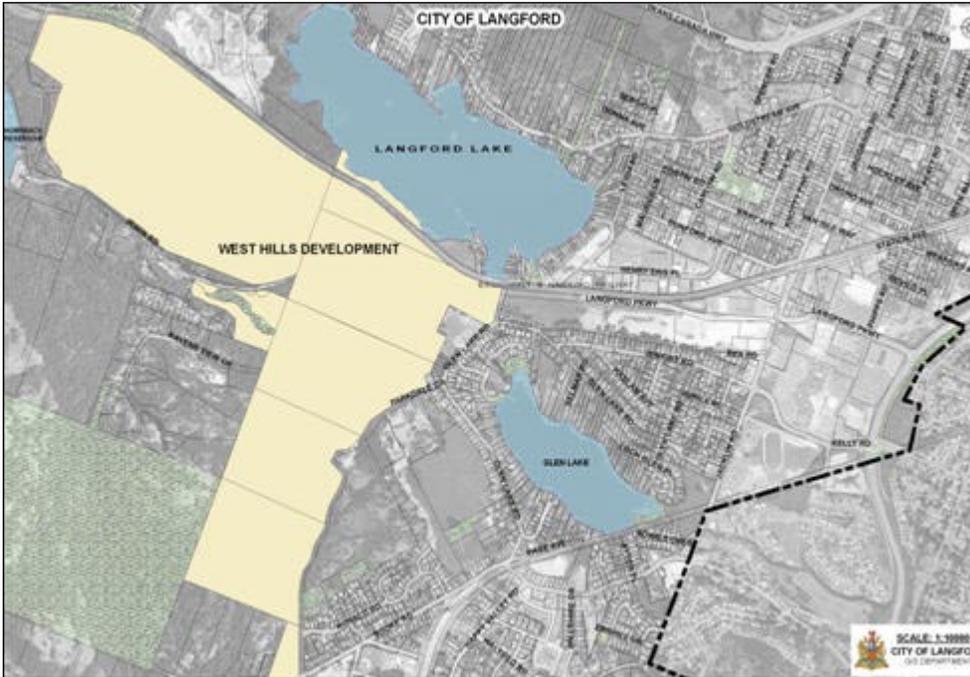
■ PROJECT HIGHLIGHTS

Location

Westhills comprises a 191 hectare (472 acre) site located west of the existing Langford town centre, and on the south shore of Langford Lakes. The site is bounded by the Langford Parkway to the north (along the lake), by Parkdale Drive to the west, and partially bounded by Irwin Road to the north.



Westhills location in Langford in the Greater Victoria area.



Landowner / Developer

Westhills Development Corporation

Development Type & Size

A comprehensive subdivision development is proposed on a 77.5 ha (191.4 acres) greenfield site.

Challenge / Reason for Project

The land comprising the plan area has been considered for development in the past. The City of Langford, however, wishes to see the lands developed to the highest environmental standards and in the most sustainable manner. It played an assertive role in encouraging the development of a single comprehensive plan for the area, as opposed to the piecemeal approaches previously proposed.

Proposed Solution

To achieve this, efforts were focused on working with the Canada Green Building Council (CaGBC) to design the plan as the first LEED for Neighbourhood Development (LEED-ND) demonstration project in Canada. LEED, which stands for Leadership in Energy and Environmental Design, evaluates developments on a broad range of criteria that deal with environmental and social issues. The Westhills Green Community Master Plan is inspired and guided by LEED principles, and is written with the LEED criteria embedded in its policies.

The City of Langford has worked with the landowner in partnership with the Canada Green Building Council and the Ministry of Community Services. Together — and through the charette process — they have assembled a team of professionals representing many disciplines to prepare a plan which has been unanimously endorsed by City staff and Council.

The implications of the Westhills Master Plan are having an impact in the City and region. Most concretely, the plan is shaping the tone of the current Official Community Plan Review, and raising questions, not about whether the City should adopt policies about sustainable development, but whether to create a platinum-certified LEED City.

Start Date

Initial discussions on the Westhills property development took place in 2005. Construction of residential and town centre/commons buildings is expected to start in the fall of 2007. Application for LEED-ND platinum certification has been made.

Completion Date

The projected completion date for build-out to 5000 units will be market driven; it is anticipated to be approximately 15–20 years, i.e. 2022–27.

■ **CONTEXT**

Social/ Economic Context

The CRD (Capital Regional District) is experiencing population growth and escalating housing costs. Outlying areas such as the City of Langford are identified as ‘affordable’ and hence have been absorbing a disproportionate amount of this growth. In recent years the City has been lauded for its efforts at creating a small urban fabric out of what one commentator previously referred to as a rural/suburban ‘dogpatch’. Westhills helps to strengthen the ‘centre of gravity’ of this urban/economic development.

Compliance with the Regional Growth Strategy

The City of Langford is a rapidly growing community of 22,000 people in the western portion of the CRD on Vancouver Island. The Regional District’s Growth Strategy calls for approximately half of the growth in the CRD to occur in this western portion, predominantly in Langford and Colwood. The entire 191 hectare (472 acre) Westhills site is located within the Capital Regional District’s Regional Urban Containment and Servicing Policy Area as designated in the Regional Growth Strategy. Adopted in 2003, this strategy contains eight strategic initiatives that form the basis for a 25 year plan for growth management in the Greater Victoria Region.

The Westhills charette produced a Master Plan that proposes to address the CRD's eight strategic initiatives, as described below:

- **Keep Urban Settlement Compact**
Approximately 2/3 of the residential units within Westhills will be contained within clustered multi-family developments thereby allowing for high density development.
- **Protect the Integrity of Rural Communities**
All of the Westhills development is located within the designated Regional Urban Containment and Servicing Policy Area and not in designated rural residential or renewable lands.
- **Protect Regional Green and Blue Space**
Approximately 40% of the Westhills site is designated a green/open space. Most of this will be left in a natural state with areas of protected forest providing wildlife corridors, but some of it will become parks, for example soccer fields. In addition to this, a portion of the lots will be covenanted to ensure that they stay in a natural state. This will help maintain the largely natural views from across Langford Lake.
- **Manage Natural Resources and the Environment Sustainably**
The Westhills Master Plan calls for 100% of the commercial and multifamily development to meet LEED criteria for environmental sustainability.

- **Build Complete Communities**
Westhills will be a 'comprehensive community' containing a mixed-use core area providing retail and service amenities within walking distance to residences.
- **Improve Housing Affordability**
Mandatory secondary suites in larger single family dwellings, a range of housing types and options, as well as 150 rental units, designated within the Westhills Master Plan as affordable housing, will help to improve affordability within a municipality that is already pro-active in this area.
- **Increase Transportation Choice**
The proposed backbone of the Westhills' transportation network is a commuter rail link to downtown Victoria. Westhills also proposes a pedestrian and bicycle trail system between residential areas and the nearby mixed-use core area. While municipal staff and the development team are enthusiastic about this feature, it is unclear at this time whether the community group organized to facilitate the commuter rail service has a working timeline.
- **Strengthen the Regional Economy**
It is expected that Westhills will provide workplaces for hundreds of local residents upon completion of the multi-use service/ commercial core area.

Municipal Leadership

The City of Langford has established a reputation as a socially and environmentally progressive, business-friendly environment. Mayor Stu Young has been at the helm of a fairly stable Council since the second year of the municipality's incorporation in 1992. Mayor and Council have clear ideas about how they see Langford growing, and are assertive in creating policies and a civic environment to facilitate their goals. The Mayor's desire to have a green, LEED development in Langford is seen as key to making Westhills a reality. The landowner and co-developer have stated that they were willing to take the risk of 'going green' once they knew they had the City as a proactive partner in this process.

City staff has described their role in terms of 'providing services to development that enhance the qualities of community and sustainability'. Interviews with developers within the region and beyond unequivocally corroborated the opinion that Langford is a responsive partner in development. Its approach, and the esteem with which it is held in the private sector, has allowed the City to develop unique bylaws and policies, and to be a leader in terms of affordable housing policies and practices, as well as sustainable development, the Westhills project being the most evident.

Pilot LEED-ND Project

Westhills is a candidate to be a North American pilot project in the LEED-ND program. In 2005 application was made to the CaGBC for project platinum status. The CaGBC is currently involved in the revision of USGBC LEED-ND standards and criteria to fit the Canadian context. The Westhills project is estimated to be platinum LEED-ND standard. At this time no selection has occurred.

Integrated Utility

Westhills and the City of Langford are also playing a pioneering role in their development of a proposed integrated utility. The proposed Westhills integrated utility could provide a benefit to the community and region, addressing as it does a growing municipal and regional need for infrastructure upgrades, especially in response to significant growth and demand for services.

Water, Drainage & Sanitary Sewer

The City has recently formed a private-public partnership with a utility for a 'collection only' agreement for sewage. This is the first such arrangement in the CRD, and required approval from the CRD for independent water and sanitary sewer systems. A similar partnership is envisioned for the Westhills development, in this case for an integrated utility that will handle water, drainage and sanitary sewer.

In conjunction with CRD regional treatment upgrade plans, waste will be collected, treated, and discharged on or near on-site. Water will also be recycled within the development wherever practical, reducing the amount of fresh (i.e. potable, pre-treatment) water used within the sanitary sewer treatment process. The City has emphasized that it will only consider a very high level of tertiary treatment, with expectations that water coming out of the sanitary sewer treatment process will be potable. A heat recovery system may also be used within the development.

At time of writing, the CRD had given approval for an independent water system in Langford/Westhills.

Feasibility of Green Technologies

Studies will commence in spring 2007 to confirm the feasibility of alternative treatment and disposal technologies, including waste heat recovery and water re-use.

Transportation

The property is located adjacent to the existing E&N rail line, and the mixed-use 'village' will be located next to a new train station. A proposed commuter rail linkage could allow for efficient movement of traffic to Victoria, or other points east of the development, as well as up Island. Westhills is proposing its own mini-transit facility within the development to service this new station. The status of this commuter rail services is not clear, and is dependent on the efforts of a community body, albeit one with significant political and economic representation.

■ SITE CHARACTERISTICS

Development Preconditions

Westhills is proposed for a hilly, forested, lakeshore site that has been logged at least twice, most recently approximately 40 years ago. This site has been the subject of several development proposals in the past. The current Mayor and Council were clear about wanting a comprehensive development proposal that would engage the whole property and bring significant benefits to the community.

Soils

Much of the municipality of Langford sits on generous deposits of 'gravelly' soils. These are ideal for stormwater recharge. It is expected that the Westhills location, a geologically unexplored site but contiguous with the geological forms that underlie the developed portion of the City, will show similar deep gravel deposits, enabling significant on-site storm water absorption and treatment.

Environment

Designated wetlands within the bounds of the property, as well as the situation on the lakeshore limit some conventional development opportunities. Natural water courses through the property and a small lake system that traverses the property will have to be protected.



HANS PETER MEYER

Environmental Inventory

Re-zoning required the developer to contract a professional registered biologist to conduct an environmental inventory of the site.

■ WESTHILLS & THE LANDOWNER/DEVELOPER

Project Attractiveness

For the owner, developing the property along ‘green’ lines is attractive for several reasons. Initially, the owner and co-developer saw a market opportunity to be ahead of an emerging demand for a new housing/ subdivision product. They also believed that ‘going green’ at this point would anticipate and meet emerging regulatory requirements. Their

cost/benefit assumptions factored in the likelihood that within the projected 15–20 year timeframe for build-out LEED-type green building, planning, and engineering standards would be mandatory across the region. In fact, at this point it is their position that, given the size of the project, and their projection of the coming market and regulatory climate, it would be a risk to *not* develop along LEED standards.

As the project has taken shape and as the owner and co-developer have become more knowledgeable about LEED, the motivation has become more personal. The Westhills development and marketing team has become very enthusiastic. They see themselves personally as involved in a progressive, responsible project. It is now not just the smart thing to do from a business and market perspective; they see it is a good thing to do for the community.

Market Timing

Given the 15–20 year build out horizon (dependent on market conditions) there is little urgency to reach completion by a specific date. A slower market means lower costs of production and gives the landowner/developer an opportunity to build inventory.

In the medium term, the landowner/developer sees Westhills meeting an actively emerging market. Over the entire build out period, the developer anticipates that Westhills will offer an established, mature product for a mature, ‘green & community savvy’ market.

The developer sees green values as helping the development through slow markets. In part this is because ‘going green’ also means addressing built-environment issues that promote community and sociability. From their perspective, these underlying design principles promote a strong sense of ‘community’ quality of life, green elements inextricably linked to social, economic, and cultural/community qualities that are key attractors in the real estate market, whether the market is hot or cold.

With regard to the maturing of ‘green’ markets, the developer sees Westhills as competitive because the project addresses a range of emerging as well as historic needs on the part of buyers (i.e. community quality of life, green sensibility). The developer is confident that it will remain a strong and competitive real estate product.

Green Premium

It is expected that Westhills properties will fall within the current North American range for green developments, which is a 5–10% premium over conventional properties and buildings. Buyers will be made aware of the medium to long-term savings due to lower operating and maintenance costs. As there is less ‘hard’ infrastructure, there may also be lower downstream tax and maintenance implications for buyers.

Marketability

The developer is positioning Westhills to appeal to mainstream home buyers. While green design is critical to the project, from a marketing perspective what is most important is that the development is seen as an attractive place to live, that people will want to make this their home. Community quality of life elements (i.e. walkability, green spaces) that are a consequence of the green design will likely be the initial attraction for home buyers and investors.

Emphasizing the ‘quality of life’ aspects of Westhills addresses the perceived ‘disconnect’ between what people want, i.e. a greener lifestyle, and what this may concretely mean. Because the Westhills project is ahead of the curve, it is in part an exercise in educating these buyers (and the real estate professionals who will be helping prospective buyers understand this new product). Westhills will demonstrate what ‘green’ looks like, what the costs are, and what the benefits are.

To that end, Westhills is currently conducting focus groups made up of recent and prospective buyers. These are helping to educate the market – and to tell Westhills where the active market currently sits with regards to its receptivity to the kinds of features and elements that are part of the Westhills project.

Real estate agents familiar with the Westhills project are of two minds, perhaps echoing the ‘disconnect’ referred to above. On the one hand, there is scepticism about home buyers being willing to pay the upfront premium of a ‘green’ house, regardless of the personal and/or community/global downstream economic & environmental benefits. On the other hand, prospective house buyers from outside of the region have shown knowledge of, and interest in, the Westhills project and the LEED-ND qualities. “Times are turning,” one agent commented. “People’s attitudes and perceptions are changing [with regards to what a ‘home’ is and how it functions in the community.]. I believe there are people who want these ecological benefits.”

The real estate agents interviewed for this project, as well as other case studies, were, however, clear that at present the ‘green’ home is still somewhat of an abstraction. Buyers are expressing little explicit interest in ‘green’ features other than open space and parks. Nevertheless, when conversation about ‘green’ features does show up (i.e. when a project or

development happens to have such features), real estate professionals are generally at a loss to describe the short, medium, and/or long-term costs and benefits of buying a green house. There is a general consensus among the real estate professionals interviewed that more concrete knowledge would be beneficial, especially as it relates to pricing/costs.

Affordability

In the developer’s opinion, the single most important thing to do with regard to affordability is to reduce the need for a second, or even a primary, single family auto (SFA). The development is oriented so that homeowners can walk to their homes, the village centre/commons, regional transit, etc. As noted previously, the project plans to link via ‘community shuttle’ with a proposed commuter rail on the existing E&N line (making Langford only 27 minutes from downtown Victoria). Such a linkage would also help reduce auto-dependence and financial commitment to the SFA, giving Westhills (and Langford) a closer connection to the urban cultural and economic centre of downtown Victoria.

In addition, the proposal is for a range of housing options that will address the affordability issue (see below for details). At the time of writing, Westhills was initiating an affordable housing strategy that will go further in addressing this issue than that required by the City of Langford (itself a leader in small city policies and programs on housing affordability).

Green Development & Leverage

Within the limits (i.e. ecologically sensitivity) of the site, working with the City on green development and LEED certification has allowed the landowner/developer to add density and efficiencies. The developer believes this will help offset the premium for 'going green,' which in turn will make properties more affordable.

Financing

The developer is providing the working capital for the project. It was explained that the self-financing nature of the development helps it to be more innovative, and to be less bound by short-term financial concerns (i.e. paying interest charges while approvals, plans, LEED-ND certification, etc. are processed).

■ WESTHILLS & THE CITY OF LANGFORD

Stream-lined Approval Process

The Westhills project, because of its status as a LEED-ND pilot, is requiring extensive attention on the part of the City. Because Westhills and LEED certification are seen as important to the municipality, the City is ensuring that staff resources are available to keep the project moving forward as expediently as possible. Council and staff view this as having significant long-term implications for

the community, and are involved with a CaGBC subcommittee responsible for developing the Canadian guidelines for LEED-ND.

This is consistent with the City of Langford's reputation giving developers and builders 'certainty of decisions' and a stream-lined approval process, especially when proposals meet City objectives (i.e. housing affordability, green design, etc). This has given Langford a competitive advantage in the region, attracting innovative development and even some risk-tolerance on the part of developers.

Taxes

Tax implications of the Westhills project are not yet clear. Questions remain about whether the cost of maintaining services and infrastructure will be higher or lower than conventional treatments. However, from a broader, longer-term perspective, the City is emphatic – not developing along green, LEED-type standards will have significant downstream tax (and other) consequences for Langford ratepayers and residents.

Maintenance

Reduced use of 'big pipe' infrastructure will lead to long-term savings and have positive tax implications for the City and residents. Generally speaking Langford has a policy of requiring developers to provide stormwater recharge on site and to maintain these systems through storm water covenants.

■ OTHER OUTCOMES

Ecological Values

Committing the project to be a pilot in the development of national LEED-ND standards demonstrates that ecological values are a priority. Both the developer and the municipality share this commitment.

Affordability

There a number of features about the Westhills development that should help address affordability issues within the community. These include:

- A mix of housing types
- Small lots
- Mandatory secondary suites, which help home owners pay for houses, provide rental housing, and sensitively add density as well as creating mixed-income neighbourhoods.
- Mandatory rental apartment buildings, something the marketplace is not producing anywhere else in the CRD (the developer is able to do this because they are self-financing, and can afford to capitalize over a longer term).
- Additionally, a general orientation away from the expense and need for a single family auto makes Westhills a potentially more affordable option than living in a conventional suburban home.

Seniors

Proximity to neighbours and services in small lot and urban areas, as well as a general design orientation towards walkability and public transit means seniors can manage without an automobile. Additionally, a range and mix of housing types may encourage aging-in-place, with consequent implications for long term health and well-being.

New Businesses

It is anticipated that there will be commercial, retail, and service opportunities in order to meet the needs of the proximate residential population in the village centre/commons.

New Employment

Again, it is anticipated that there will be some limited new employment within the municipality, located in the village centre/commons.

Impact / Influence on Subsequent Developments in Area / Region

The process of developing a site of this size, and of going through the LEED certification process has been educational for municipal staff and Council, the Westhills developer, and other parties. It is already evident that the Westhills process is having an impact on how the City addresses development proposals. Langford launched an Official Community Plan Review in 2007 and the underlying question being posed as part of the review is, "How can we create a platinum-certified LEED City?"

In the interim, the Westhills project and the process of being involved in a LEED-ND pilot is influencing other development in Langford, i.e. there is a greater expectation of green design and 'smart growth' features. Westhills is viewed by staff as a pilot not just for Canada or North America, but for future policies and development within the municipality. It is, as Clerk-Administrator, Rob Buchan, puts it, now part of the mind set within the municipality, helping staff and Council focus policies on what the City should be.

■ CONTACT INFORMATION

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Jordan Fisher, Project Coordinator

Westhills Land Corporation, (www.westhillsgreencommunity.com)

Tel: 250-383-9281

■ CONTACTS / REFERENCES

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- Westhills Land Corporation — Ryan McKenzie (Manager) 250-383-9281 (www.westhillsgreencommunity.com)

- Enkon — Susan Blundell (professional biologist) 250-480-7117
- Stantec - Richard Rebneris (civil engineer) 250-388-9161
- Rob Wickson (economist/rapid transit specialist) 250-384-5451
- Margaret Symon (professional forester) 250-743-4064
- TBKG — Andy Kesteloo (LEED certified consultant), Vernon Andres 250-818-3481 (www.tbkg.com) 250-383-9281 Jordan Fisher 604-250-1292 Boyd Cohen
- Busby, Perkins and Wil — Terry Williams (architect — initial renderings) 250-384-7878 (www.perkinswill.com)
- Lombard North — Jim Partlow (landscape architect) 250-386-3336 (www.lombardnorth.com)
- Keycorp Consulting — Jim Hartshorne (land development contractor) 250-384-8024
- Design Centre for Sustainability at UBC — Patrick Condon & Elisa Campbell (Smart Growth consultants) 604-822-8351 (www.dcs.sala.ubc.ca)
- Boulevard Transportation Group — Mike Skene (transportation engineer) 250-388-9877 (www.blvdgroup.ca)

Green Value Strategies on Vancouver Island

PROJECT TITLE:

Willowbrook Subdivision: Swan Creek Restoration

■ OVERVIEW

The District of Saanich has been a leader in stream and wetland rehabilitation through its policies concerning parkland acquisition, development, and support of innovative approaches to stormwater management. This is an important part of the context for what the principals at Aqua-Tex Scientific Consulting call ‘modules of opportunity’ for successful stream rehabilitation work. These modules occur when rezoning, re-development, and/or construction takes place that enables all parties landowner, builder, and municipality — to experiment with new technologies and approaches that help to restore damaged urban and suburban wetlands.

The Willowbrook subdivision at 650 McKenzie Avenue is an excellent example of such a ‘module of opportunity’. It is an urban infill development on land within the 200 year flood plain for Swan Creek. Two previous applications for development, utilizing conventional engineered solutions for stormwater management and flood control, had failed.

In the Fall of 1999 Aqua-Tex principals Patrick Lucey and Cori Barraclough were working on a wetlands ‘fix-up’ on a property in the Glanford Station area. While doing this they saw the rezoning notice for the neighbouring 650 McKenzie property, and considered it to be an excellent ‘module of opportunity’. Mr. Cam Pringle, prospective land buyer (and rezoning applicant), also saw



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Swan Creek before panorama (above) and after development (below).

an opportunity in the McKenzie site. Inspired by Aqua-Tex’s work at Glanford Station, he contacted Aqua-Tex to explore a natural systems approach to dealing with the flooding and stormwater management issues on the site, issues which made the land relatively inexpensive. Resolution of these issues through a ‘green’, natural systems approach, would, he believed, help his re-zoning application and allow him to develop the property. It would also allow Cadillac Homes Ltd., Mr. Pringle’s company, to build small lot, affordable housing in Saanich, something he’d successfully done in the City of Langford.

After hydrological modelling of the site, and addressing due diligence and liability issues facing both the developer and the

municipality, Aqua-Tex proposed a suburban stream and wetland system based on Proper Functioning Condition (PFC) criteria (for a definition of PFC go to *Additional Related Material* at the end of this case study). PFC criteria were also used to define how the subdivision and road layout would be developed, given the need to keep water on the land as long as possible. The design also addressed public safety issues, wildlife habitat requirements, and the recreational and aesthetic benefits of a new park. The existing ditch was effectively turned into a proper creek, with considerable enthusiasm from all parties involved.

PROJECT HIGHLIGHTS

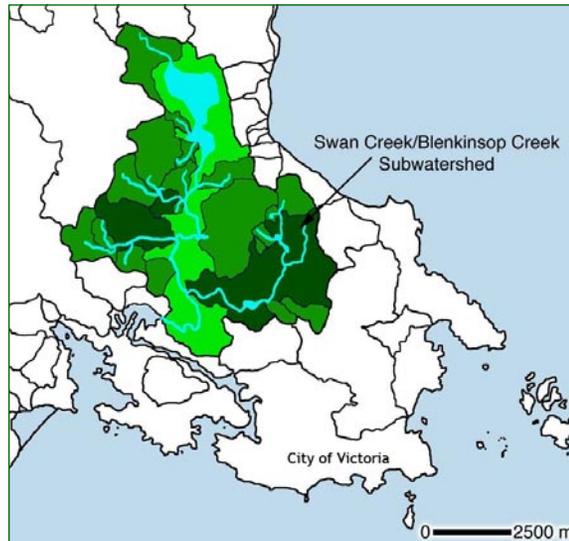
Location

650 McKenzie Ave
Saanich, BC
(Vancouver Island)

Landowner/ Developer

Cadillac Homes Ltd.
Principal: Cam Pringle

Colquitz River watershed in Saanich, B.C. on southern Vancouver Island



Aerial view of the Willowbrook subdivision, Glanford Station, and re-developed Swan Creek wetland.

Development Type & Size

Willowbrook is a greenfield property of approximately five acres. It is a 31 lot subdivision for single family homes, with 17% of the property dedicated to parkland.

Challenge / Reason for Project

To date the property had not been developed because of frequent winter flooding, the cost of conventional engineering solutions, and the fact that it lies within a 200 year flood plain.

Proposed Solution

A stormwater and flood control design based on natural systems (Proper Functioning Criteria).

Start Date

Discussion and planning began in the late summer/early fall of 1999. Construction began in May 2000.

Completion Date

Work was completed and the stream waters returned to a new creek bed in September 2000.

■ CONTEXT

Caveat

While stream rehabilitation and even creation is an attempt to restore naturally functioning systems, this is not restoration to a pre-development state. The stream exists in a suburban and/or urban context. The project is an incremental step, significant but still only a step, towards a naturally functioning system. Balance between the limits and opportunities presented by a site, and the various constraints presented by the landowner, developer, Council, and various regulatory bodies is the goal. Over time it is hoped that the balance will shift towards the benefits to be gained through a more naturally functioning stream system.

Regulatory Environment

This project was undertaken prior to the introduction of Riparian Areas Regulation under the Fish Protection Act (the RAR came into effect in March 2006). At the time, approvals were required provincially under Section 9 of the Water Act and federally from the Department of Fisheries and Oceans.

Key Challenge

Former District Deputy Engineer, Rick Lloyd, described the chief obstacle to the project as the hydrological features. A previous landowner had proposed development and rezoning of this property several times but the municipality had always denied approval due to flooding issues. Subsequent efforts to

sell the land had also failed because of municipal resistance to residential rezoning for flooding reasons. When Cadillac Homes first considered buying the land they proposed to 'lift' the land, which was not an acceptable solution to the municipality. The subsequent Aqua-Tex proposal was, in Mr. Lloyd's view, encouraged by the municipality.

It should be noted that while the municipal engineers were inclined towards the project, civil engineers working for the developer thought it was an expensive exercise and were sceptical about its benefits to the developer.

Approach

The consultants' approach to freshwater systems rehabilitation was to focus on collaboration and experimentation/innovation within 'modules of opportunity'. In order to present the consultants' vision for the project, identify common goals, address immediate concerns, and obtain support from the landowner and all the municipal, provincial, and federal regulatory bodies everyone was invited to a site visit. As a result, cooperative relations were established between all parties and approvals were expedited. This underlines Rick Lloyd's (District Deputy Engineer at the time) assessment of the key features of this project: local government's prioritization of stream stewardship, the spirit of collaboration between all parties involved, the prospective landowner's willingness to try a new approach, and Patrick Lucey's leadership role.

Rezoning

Rezoning was approved, subject to the stormwater management technologies proposed by Aqua-Tex. The site had previously been zoned for 17 lots and houses with 5% parkland contribution; rezoning permitted 31 lots and houses, with 17% parkland dedication.

■ **SITE CHARACTERISTICS**

Environmental Concern

Swan Creek flows from Swan Lake to the Colquitz River, which has been identified as an environmentally sensitive salmon rearing river since the 1970s. Historic ditching and straightening of the creek facilitated farm development; however loss of historic wetlands and ponds created a net loss of salmonid rearing and spawning habit, as well as habitat loss for bird species.

■ ECOLOGICAL DEVELOPMENT METHODS

In order to address liability issues for the developer and municipality new hydrological modelling of Swan Creek was done to update 200 year floodplain baseline information. The design of the urban stormwater system was based on natural systems, i.e. ponds, wetlands, a new pond and channel for Swan Creek, all based on Proper Functioning Condition (PFC). [Refer to the *Additional Related Materials* section of this study for an explanation of PFC]. The fact that this was a clean site meant that there was no need to clean out the pond designed to hold sediment during construction.

Stormwaters were divided into the north and south sides of the property. Wetland modules were combined by adding the stormwater from older subdivisions to maximize treatment and protection for Swan Creek. As Cori Barraclough explained, “The wetlands and the north end of the project treat stormwater from off site as well as the Willowbrook site. They are one module. The wetlands at the south end treat only Willowbrook’s water. They are a second module. The wetlands to the north west were built as part of the other subdivision, but all three work together to treat water from the area before it enters the creek.”

■ COST / BENEFIT ANALYSIS

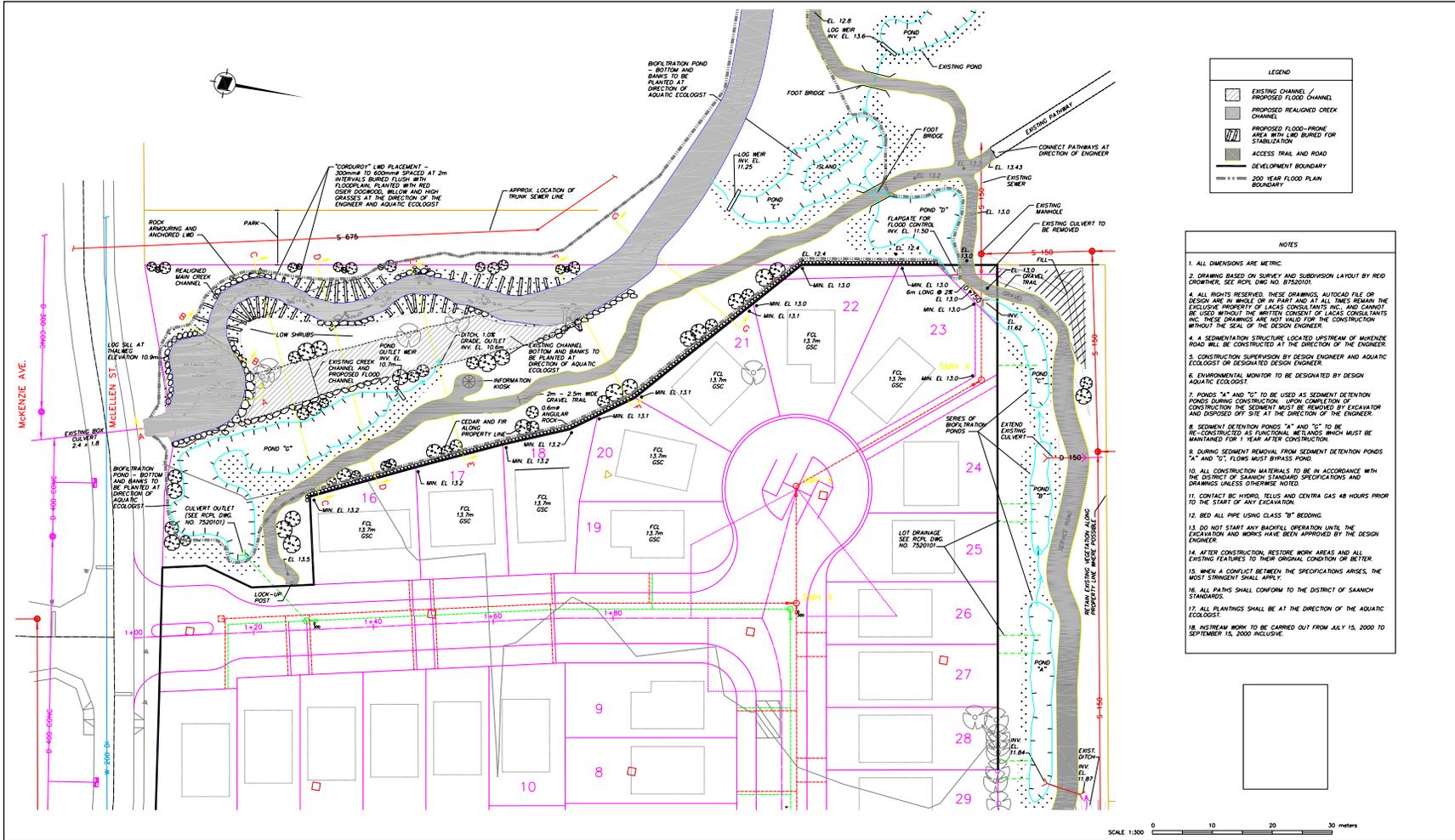
Municipal Costs/ Benefits

Gerald Fleming, Planning & Design Manager with the District of Saanich Parks Department, indicated that the Willowbrook subdivision provided a number of benefits to the municipality and community. There was significant parkland donation (17% versus the standard 5%), which allowed a strategic trail connection to the Glanford neighbourhood (a goal of Saanich Parks Dept.). As well, community needs for environmental improvement were met. In Mr. Fleming’s words, this portion of Swan Creek was “basically a poorly functioning ditch”. After development, the watercourse was “a stream with new trees, shrubs, and ground cover, creating a more natural environment/habitat.” He emphasized that this area became a site for schools involved in planting programs.

The only downside Mr. Fleming saw was the persistent issue of invasive plant species. “Over time we have made some progress,” he adds. “This is probably the only drawback to the whole experience.”

Municipal Maintenance Costs

Former Saanich engineer Rick Lloyd suggests that the Swan Creek project has significantly reduced maintenance costs for the municipality. While silt entrapment ponds need to be cleaned every 10-15 years, depending on conditions, and naturalized streams require the same attention, it is his experience that the ‘straightened’ creek (i.e. common ditch) requires cleaning every 4-5 years.



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Landowner/Developer Costs/Benefits

To develop a natural-stream/wetland type of system with Proper Functioning Conditions cost the Cadillac Homes approximately \$250,000.

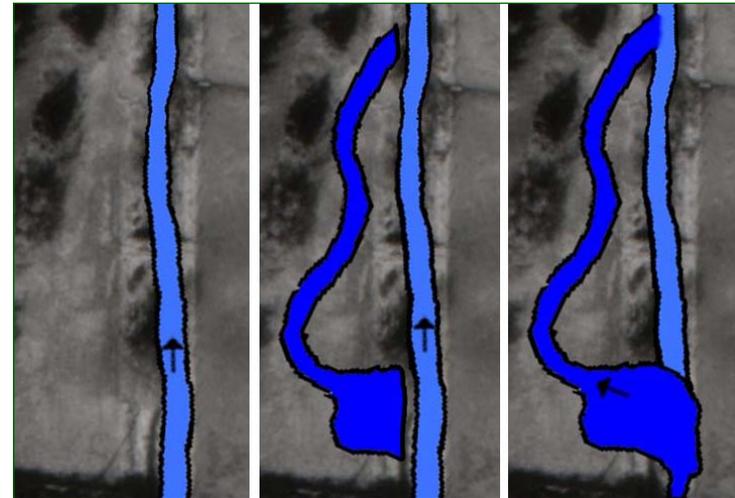
Owner Cam Pringle was unequivocal. "There was a huge benefit going this route. Using 'green' stormwater management technologies and providing a higher percentage of parkland allowed me to achieve density, an affordable housing product, and financial success." It was, in his view a 'win-win-win' for buyer, municipality, and developer.

Mr. Pringle already had experience building on small lots in Langford. Willowbrook helped him build a relationship with the District of Saanich, which made a subsequent (Royal Oak) development that much easier.

Land Owner/Developer's Project Experience / Financial Returns

Opportunity to Develop Previously 'Un-developable' Land

The developer identified the cost of stream restoration work as approximately \$250,000. What he received for this cost, from his perspective, was the ability to profitably develop a property that had previously been denied development approval.



From 'straightened' to sinuous, properly functioning creek.

Fast Track Approval

The consultant believes that the developer's investment in Swan Creek had additional benefits. It is Aqua-Tex's view that because support for an ecological approach was so strong from all the regulatory bodies permits were obtained in 63 days, rather than the normal timeframe of months or up to two years. The 60+ days required for the Willowbrook subdivision approvals is unusual, and is directly related to the stream work done by the developer. Aqua-Tex suggests that the savings in interest charges on project financing may have more than paid for the stream restoration program. Additional research needs to be done on this issue.



The developer noted that he felt that the process in the District of Saanich was slow (perhaps in comparison to other jurisdictions, for example the City of Langford, where Cadillac has done work, and which has a reputation for facilitating development that meets municipal and community priorities).

He felt that having a 'green' stormwater system certainly enabled the project to go ahead at Willowbrook. However, it did not, in his view, accelerate the approvals process. He believes that the new approaches actually slowed the approvals process as staff and Council were unfamiliar with the technology and required assurances. It was also, however, the first time that the District had worked with Cadillac Homes, and this may have slowed the process. It is his experience that approvals subsequent to this project have been faster, in large part, he believes, because of the positive experience of Willowbrook.

What explains this difference in perception between the consultants, municipal staff, and the developer? It may in part be due to what Mr. Pringle suggests could be the District of Saanich's twice-shy approach after some history of poor developer/municipal relations. It may also be that Cadillac Homes has worked in municipalities where responsive developers who are interested in affordability and stream rehabilitation are given fast-track treatment, at least faster than was Mr. Pringle's experience in the Willowbrook case.

With regard to outside financing, Mr. Pringle spoke highly of his relationship with Coast Capital Savings Credit Union. "They accept that this approach, i.e. green, small lots, smaller houses, is the way it is now. "They may not be especially sensitive to green," he explained, "but they do understand the business bottom line."

Leverage to Obtain Flexibility

The Aqua-Tex PFC technology of using natural-type streams and wetlands for stormwater and flood management are perceived by all parties as giving the developer leverage to obtain higher than normal density levels. As indicated previously, previous zoning would have allowed approximately 17 lots/homes. After rezoning and stream rehabilitation, Cadillac built 31 homes on the site, as well as contributing 17% of the land area for park alongside Swan Creek.

Rental Opportunities if Needed

Finally, the developer was able to build smaller, affordable houses on smaller lots. He was therefore in a position to be able to afford to rent out houses if the market slowed. As it turned out, this was not an issue as the market for his product was very strong, with houses selling as fast as Cadillac Homes could build them.

After Willowbrook

The Willowbrook subdivision experience was a positive experience for Cadillac Homes and led to several similar projects in the District of Saanich, and elsewhere in the CRD and now the Cowichan Valley.

Within Saanich, Cadillac proposed a similar type of development in the Royal Oak area. Again the emphasis was on smaller than conventional lots and houses, creek restoration and riparian zone work, and high percentage parkland dedication (40% of 10 acres). In return, the municipality granted higher densities. As with the Willowbrook site, the Royal Oak project had a history of several previous failed development applications. Mr. Pringle believes Cadillac Homes was successful because they struck a balance between density and open space, and because of the relationship built in the Willowbrook process.

He notes, however, that his primary motivation, building affordable houses for first time home buyers, is becoming more difficult to realize in the Saanich area due to market pressures. “The problem is affordable land,” he says, and has therefore turned Cadillac’s attention to the ‘western communities’, i.e. Langford, and the Cowichan Valley, where land is less expensive than in the Saanich area.

Pride & Reputation

From a ‘green’ perspective, Cam Pringle referred to the ethical component to his work – that to do ‘green’ development is about leaving a legacy. He also expressed pride in Willowbrook. “The

project won a municipal award for its environmental features, as well as peer recognition amongst other landowners and developers. More and more are coming on side,” he noted.

Mr. Pringle noted that recognition from the community and the municipality is good business; it helps the next time around in the approval process. He also mentioned that building affordable homes and using green technologies helps to change the image of developers. It is his perception that more developers are seeing the advantages of adopting green elements and therefore choosing to incorporate them, as well as being driven by a changing regulatory environment in which green storm water management and stream stewardship is emphasized as a condition of development.

Marketability

“I’d love to say that everyone was thrilled with the ‘green’ aspects of Willowbrook and the creek rehabilitation,” says Bruce Hatter, the selling real estate agent. “But it wasn’t a huge factor in the house sales.” In his view, ‘green’ is not yet a part of the conversation with home buyers. “They were more interested in what they were going to get, and at what price.”

Mr. Hatter notes that, “The timing was great. Willowbrook came on stream just as the market started to rise.” Initially, houses were listed at an affordable range of \$219,900–\$239,900. This was approximately 30% less than comparative new homes in similar

markets. There was, in the agent's view, nothing available at this price in the regional new construction market. Equivalent houses in this price range were 30–40 years old and in need of repair.

The trade-off was in a smaller lot and house size than neighbouring new construction. However, houses were sold as they were built and the builder could not keep up with demand.

With some resale activity in recent years the properties continue to show appeal. Mr. Hatter has seen houses bought in recent years for \$250,000–\$270,000 sell for upwards of \$400,000. Some houses in this development are currently listed in the \$480,000 range, representing a possible 100% increase in value in approximately 6 years.

The agent identified the following features as selling points:

- an emerging market demand for smaller lots with buyers who are less interested in yard upkeep and more interested in 'out-of-yard' recreation, i.e. golfing, boating, etc.
- a desire to be close to amenities
- a willingness to purchase a small lot rather than deal with the condo/strata situation.



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■ OTHER OUTCOMES

Ecological values

Swan Creek has been restored from a 'straightened' creek to a natural-type stream as part of the general rehabilitation of the Colquitz watershed in the District of Saanich.

Anecdotal reports by local residents indicate that bird life and activity has increased subsequent to the stream and wetland work. There is a noted increase in songbird and raptor activity.

Water Quality

During the project water sampling was done as part of NSERC (Natural Sciences & Engineering Research Council) funded graduate research by Lehna Malmkvist. Aqua-Tex is currently undertaking sampling as part of the Nature's Revenue streams project. This was begun in October 2006. The most recent sampling was taken in mid-April 2007. At time of writing, Aqua-Tex did not have sufficient data to be able to draw any conclusions on water quality at the Willowbrook site.

Social Values

Affordability was a driving value behind the Willowbrook subdivision proposal. Affordability is determined by the cost of land. In this case, the land was relatively affordable because it was considered difficult to develop due to winter flooding. Also, the subdivision proposal focussed on smaller lots and small houses than are conventionally built. These savings were passed on to home buyers.

In addition, the Willowbrook development increased recreational values through the extension of trails and parkland.

Initial plantings at the site were threatened by vandalism. In an inspired move, the consultant hired the vandals (several young teens in the area) to watch over the restored plantings, making them stewards of the trail/creek habitat. The youth assumed ownership of the project, and to date, no significant vandalism has occurred.

General / Community

Aside from helping to deal with general neighbourhood stormwater management and potential flooding issues, the Willowbrook subdivision and Swan Creek work has generated recreational opportunities with enhanced trail linkages and wildlife habitat. Cadillac Homes received a civic award for this work. The Swan Creek project provides long term, onsite stormwater management. A sewer right-of-way was used as a space to provide additional wetland treatment and to construct a walking trail, thus adding functionality to otherwise unused space and retaining full access for repair and maintenance. Trails and bridges were built as part of the project and as a result the neighbourhood has some key access routes through a naturalized park area to schools, shops, other parks etc.

It is Mr. Lloyd's opinion that the community benefits "enormously" from walkway and riparian rehabilitation. "Kids are involved, people love it, it attracts birds. Local schools use it for field trips. Visitors use the trails as nature walks."

Economic Impact on the Community

As yet it is unclear how much economic benefit the re-designed Swan Creek wetland provides for the immediate neighbourhood and downstream community. The consultant notes that the work done at the Willowbrook services neighbouring properties. Given the heavy winter rains of 2006-7 it may be appropriate to value any savings related to basements and roadways not being flooded due to the work of Cadillac Homes and Aqua-Tex.

Impact on Other Developers

In Mr. Hatter's opinion, the success of the Willowbrook project has had some impact on other developers and builders. Cadillac's good ideas (i.e. arts & crafts styling, small lots and smaller houses) have, in his words, "been picked up by the competition."

Managing Invasive Species

Maintenance of natural-type stream situations is a persistent issue. This is especially the case with invasive species, primarily blackberry. Typical ditch maintenance involves industrial solutions such as excavation/ dredging and/or mowing with machinery. Natural streams are not amenable to these techniques.

Construction of natural-type streams create optimum conditions for invasive species. Disturbed soils, inappropriateness of industrial treatments, planting regimes and requirements of natural functioning systems, and communication/ training issues for maintenance personnel all need to be addressed. The consultant believes these issues, while significant, are part of the learning required when using new technologies, approaches, and systems.

Possible solutions include:

- planting the site immediately
- using the largest affordable plants & trees, even it means using fewer
- prioritization of irrigation to secure planting success
- heavy mulching of planting (this will maintain moisture in the soil and inhibit weed species)
- a 'clear out the wetlands' module ought to be part of the standard operating/maintenance procedures
- appropriate training for maintenance staff
- continuity among consultants, staff involved in project construction, and staff involved in project maintenance.

■ PROFICIENCY / EXPERTISE

The consultant describes those involved in this project as being ‘first rate’ in terms of proficiency and willingness to learn.

Municipal Staff

Stream ecology training is specialized, and typically not part of municipal staff training programs. Any significant stream work, especially if it involves private lands, involves a steep learning curve for staff.

As well, there are often tensions or differences between municipal staff goals and developer/landowner goals. One landowner noted that it would pay staff to be sensitive to financial (and other factors) that play a role in a developer or landowner’s ability or willingness to meet municipal requests, or even to participate in a project.

As noted elsewhere, ‘green’ technologies and approaches are still unconventional, and require a willingness to experiment. The consultant suggests that a way to grow expertise and competencies at a local level is to initiate or support small projects. This permits experimentation and education, and incremental change at a manageable (from a risk perspective) pace. It has the additional benefit of demonstrating to other jurisdictions some of the costs and benefits of particular approaches.

The relative novelty of these technologies, and the limited training in stream ecology, puts municipal staff in a difficult position. Staff is charged with protecting the community interest and being mindful of any and all potential liability issues. New approaches require a willingness to risk and to trust. Even if they are supportive of the goals of a project, their lack of knowledge and the largely site-specific application of natural systems approaches means they either trust the consultant, or they don’t.

Because the consultant was known by staff and Council, and had built a relationship and reputation through several smaller projects, the municipality was willing to put some trust in the consultants and their vision for the project, i.e. the creation of a natural-style Swan Creek pond and wetland system.

Professionals / Consultants

Those involved with the project were highly appreciative of Patrick Lucey’s leadership and the skills of the Aqua-Tex team. The work described in these projects has been referred to as “ground breaking & innovative”, and — after several years of experience with the practical side of natural-type streams as part of a stormwater management regime — successful.

Mr. Pringle describes working with Aqua-Tex as a “tremendous education for all of us at Cadillac Homes, the municipality, Council, and the public. Patrick Lucey saw the opportunities in what was previously seen as un-developable land. He educated the developer/landowner, Councillors, and the public as to why a development should go ahead.”

Others interviewed credited Lucey and Cori Barraclough with the skills and patience to work within the limits of historically insensitive (from a fresh water perspective) policies, practices, and bureaucracy, a willingness to experiment, and the ability to develop trust & goodwill, as well as collaborations that have led to important results for landowners, the municipality and the community.

Contractors / Builders

The excavation and construction contractor, Joseph Brown Contracting, was involved in the earlier Blenkinsop Creek project. He had been identified while working on wetland rehabilitation. That experience encouraged Mr. Brown to invest in specialized excavation equipment (long-boom, vegetable-based hydraulics), and to actively pursue sensitive habitat work.

LEARNINGS

The consultant pointed out that, despite best efforts, it is impossible to re-create a fully natural stream system in a developed suburban or urban context. The goal is a proper functioning natural system. Stream restoration, or stream creation in this case, is, however, is an incremental process. To address broader wetland and watershed quality issues, it is, nevertheless, important to take advantage of ‘modules of opportunity’. Every change in zoning and land use presents one of these ‘modules of opportunity’ and these permit developers and municipalities to take steps toward the goal.

Suggested strategies in meeting some of the challenges of effective stream work include:

- Start small and develop skills and expertise on a manageable scale before taking on larger projects
- Create a plan at the beginning of projects
- Incrementally improve the plan. Do not abandon the plan. Difficult goals are reached in incremental steps, all the while keeping an eye on the goal.

The developer made a comment that was central to the success of this project. In his words, “Profit is not a dirty word for Patrick Lucey. He is able to see that the profit motive can be used to satisfy environmental ends and community needs.”

This fits with Cori Barraclough's cautionary words about both the incremental nature of learning how to work in sensitive areas and the expectations of those who want stream work to create a pre-development situation. It is also consistent with the Aqua-Tex modus operandi of looking for 'modules of opportunity' to move urban and suburban wetlands towards a better state of health. If the landowner/developer can be shown that it is profitable to be 'green', 'green' development is more likely to occur.

■ CONTACT INFORMATION

Patrick Lucey and Cori Barraclough
Aqua-Tex Scientific Consulting Ltd.
Tel: 250-427-0260

■ REFERENCES

Project Team

- Cadillac Homes Inc. — Cam Pringle (partner/developer, landowner), Ste.120, 842 Brock Ave, Victoria, BC, V9B 6W9
250-380-9894 (www.itsacadillac.com)
- Aqua-Tex Scientific Consulting Ltd., Cori Barraclough & Patrick Lucey (stream ecologists, lead consultants)
250-427-0260 (www.aqua-tex.ca)
- District of Saanich — Gerald Fleming (Park Planning & Design Manager)
250-475-5532
- Rick Lloyd (Deputy Engineer with District of Saanich at time of project, now with RCL Consulting)
250-477-7003
- Swell Environmental Consulting — Lehna Malmkvist (Registered Professional Biologist; Natural Science & Engineering Research Council [NSERC] researcher during project)
250-598-7947 (www.swell.ca)
- LaCas Consultants Inc., Professional Engineers and Hydrologists based in Vancouver, BC. Brian LaCas (hydrologist), Suite 200 – 1311 Howe St., Vancouver, BC V6Z 2P3
604-688-2535 / cel: 604-816-8015

- Joseph Brown Contracting — Joseph Brown (excavation, construction), 960 Ferncliffe, Victoria, BC V9C 3X9
250-888-5199
- Eco-Action 2000
- E-Team (BC Ministry of Environment)
- Katimavik
- Victoria Geomatics
- Capital Regional District—Forestry Division
- University of Victoria
- St. Michael's University School
- Swan Lake Christmas Hill Nature Sanctuary,
Board of Directors
- Pacific Christian Academy
- Pacific Coast Savings Volunteers
- Royal Oak Burial Park
- Royal Colwood Golf and Country Club
- Victoria Natural History Society
- South Island Aquatic Stewardship Society

■ ADDITIONAL RELATED MATERIALS

[1] Proper Functioning Condition (PFC)

PFC is a methodology for assessing the physical functioning of riparian and wetland areas. The term PFC is used to describe both the **assessment** process, and the on-the-ground **condition** of a riparian-wetland area.

The PFC **assessment** provides a consistent approach for assessing the physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. The PFC assessment synthesizes information that is foundational to determining the overall health of a riparian-wetland area. The PFC on-the ground **condition** refers to *how well* the physical processes are functioning. PFC is a state of resiliency that will allow a riparian-wetland system to hold together during a 25 to 30 year flow event, sustaining that system's ability to maintain both physical and biological attributes.

For further information about PFC refer to (<http://www.mountainvisions.com/Aurora/pfc.html>)

[2] Malmkvist, L. *Smart Municipal Development: Urban stream restoration and stormwater management in residential and agricultural development areas in Saanich, BC*, (Masters of Science thesis, University of Victoria, 2002).

A.J. Forsyth, a Division of Russel Metals Inc., Nanaimo

Highlights

- ◆ Identification and preservation of environmentally valuable resources (*DwC pages 3-13, 3-15, 3-17, 4-22*)
- ◆ Removal of invasive species, landscaping with native species (*DwC pages 3-21, 3-22*)
- ◆ Ecosystem restoration, tree replacement (*DwC pages 3-19, 3-21, 4-40*)
- ◆ Site monitoring during and after construction (*DwC page 4-34*)



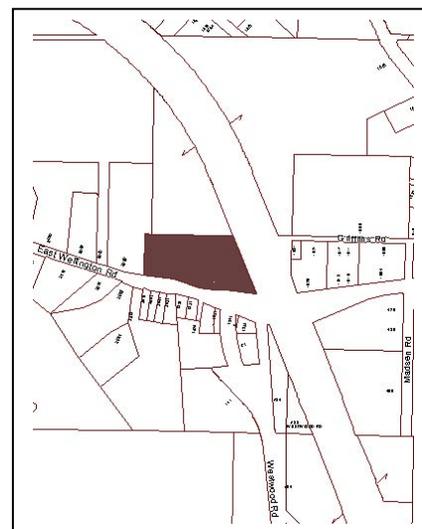
Photo courtesy JPH Consulting

Background

A.J. Forsyth, a division of Russel Metals Inc., supplies and processes a variety of metal products. The warehouse and service centre in Nanaimo is one of nine locations throughout B.C. When Russel Metals bought A.J. Forsyth in 2002 and amalgamated the two Nanaimo operations, a larger office and service centre was required. The company needed a large, flat industrially-zoned parcel within Nanaimo to provide a convenient location for its south-central Island customer base. Aries Construction Management Limited (Delta) was hired as project manager to oversee the design, approval and construction of the new facility.



Figure 1: Location Map



Environmentally Valuable Resources

The site chosen for the new operation is on East Wellington Road in central Nanaimo, on the west side of the Inland Island Highway (the "Nanaimo Parkway") (Figure 1). The site had previously been partially cleared and used as outdoor storage (Figure 2). The site sloped from north to south, with an older second-growth coniferous forest on the east side. The southeast border supported a small Garry oak woodland, one specimen Garry oak tree remained along the southwest side, and a few Garry oak saplings survived amidst a pile of

rock rubble and invasive plants in the centre of the property. The presence of East Wellington Road was likely a factor in the continued existence of this remnant Garry oak stand, as it prevented the south side from being overtaken by coniferous forest.

Figure 2a – Pre-development condition (courtesy of JPH Consulting & City of Nanaimo)



Figure 2b – Site today (courtesy of City of Nanaimo)



City Requirements

The property fell within the City's Development Permit Area (DPA) 22 "Nanaimo Parkway Design", designated for natural environment protection and for building form and character. Due to the presence of the Garry oaks and other significant trees on the site, the development permit application triggered the requirement for a Tree Management Plan that retained a 25-metre wide treed buffer along the Parkway and addressed the management of the oaks.

Pat Harrison of JPH Consultants Ltd. was hired by Aries to draft the Tree Management Plan. However, in his initial site visits, Harrison noted that there was a good opportunity to preserve the Garry oak stand "with a few tweaks to the site plan".¹ He proposed a landscape plan that would integrate this stand along with other native plantings and ground cover (Figure 3). Both the client and the City agreed that this would be a desirable alternative to a conventional landscaping and screening treatment.

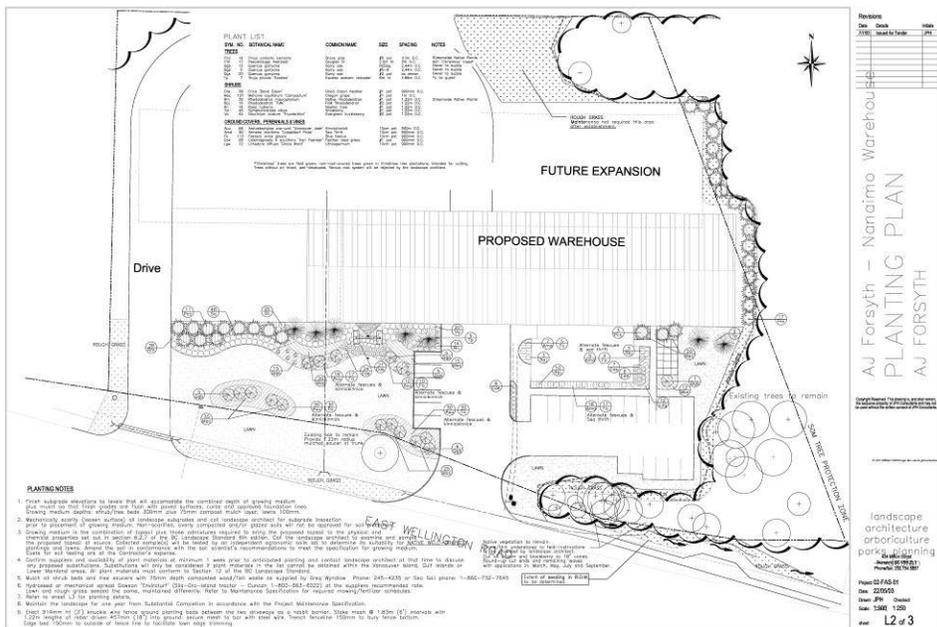


Figure 3 – Landscape plan (courtesy of JPH Consulting Inc.)

In addition, the City required the company to provide some form of visual relief to a large, blank steel wall (30' high by 120' long) that would face East Wellington Road and the neighbouring residential area. Rather than a conventional wall articulation, Harrison suggested and the project team agreed to add a large metal silhouette of a Garry oak tree to the building façade, framed by native plantings (Figure 4).

¹ Harrison, P. 2005. "Oak and Steel." Sitelines – J. of BC Society of Landscape Architects, June-July 2005; 9-11

Figure 4: Building motif (courtesy of JPH Consulting Inc.)



Implementation of Develop with Care Guidelines

Preservation of environmentally valuable resources

A threatened ecosystem was retained and integrated into the site landscape. A wide forested buffer was also retained, maintaining the visual and wildlife corridor along the highway.

Site grading was adjusted in a manner that better accommodated the landscape plan. The floor level of the building was lowered to reduce the driveway grade for loaded trucks entering the warehouse. This also reduced the slope down to the south boundary, avoiding changing the grade significantly around the Garry oak trees.

Removal of invasive species, landscaping with native species

Harrison manually removed invasive species (primarily Scotch broom and Himalayan blackberry) and treated the stems with herbicide by hand over a 6-month period. Harrison also conducted careful pruning of Garry oak trees and woody understory plants (e.g., Saskatoon berry, ocean spray) to improve growth and robustness.

In the landscaped portion of the site, a limited assortment of perennials were chosen to be low growing, non-competing ground cover for the beds where seedling Garry oaks were planted. These species and the fescue-dominated 'enviro-turf' lawn were selected for drought tolerance. The growing medium for the landscaping was layered to simulate a natural gradation of composted wood waste (75 mm depth) and sandy soil with compost (300 mm).

Ecosystem restoration, tree replacement

All "significant" trees removed from the building footprint were replaced 1:1 with native species, including some 30 Garry oaks that were planted in the southwest portion of the property. Any plantings that died within the first two years were also replaced.

Site monitoring during and after construction

The site was monitored during construction to ensure adequate protection of tree roots and the understory.

After construction was completed, A.J. Forsyth retained Harrison for about a year to follow up on the landscaping success. Since then, a reputable landscaping company has been contracted for ongoing maintenance and informal monitoring of the site that includes invasive plant removal and assessment for hazard trees along the Parkway buffer.

Benefits – the "win-wins"

- ◆ The development preserved an example of a fast disappearing ecosystem as well as a forested corridor.
- ◆ The plan raised the awareness and generated a sense of pride on the part of the landowner in the natural environment of their site.
- ◆ At the neighbourhood level, A.J. Forsyth has received compliments from residents regarding the landscaping, tree retention, vegetated buffer and the "outdoor art".
- ◆ From A.J. Forsyth's perspective, the attractiveness of the site reflects the company's desire to be a good corporate citizen. In addition, the presence of trees, greenspace and

“rabbits and deer” boost staff morale and pride; and the forested buffer shields them from highway noise and provides shade in the summer (J. Johnson, pers. comm.).

- ◆ Beyond the landscape treatment, the tree silhouette façade not only addressed the ‘blank wall’ requirement, it also demonstrated the company’s products and services while communicating an appreciation for the site’s natural environment – all for about the same cost as a more conventional architectural embellishment.²
- ◆ From the broader community’s perspective, the development raised the standard of industrial site landscaping. This worried A.J. Forsyth to some extent; while it is a large company that can afford this type of treatment, many of its clients are smaller businesses that would not be able to match that standard on their site.

Awards

A.J. Forsyth/Russel Metals and JPH Consulting both received Design Awards in 2003 from the City of Nanaimo, “for excellence in design within the City”. In 2006, A.J. Forsyth also received a Community Service Award from the BC Society of Landscape Architects for its “special contribution to preservation, management and/or enhancement of our natural and human-made landscapes”.

Lessons Learned

- Tree planting originally occurred in late summer, but a number of the trees did not survive the dry summer-fall season and had to be replaced with new trees the next spring.
- Post-construction management and ongoing horticultural care are critical to maintaining the planted and natural landscape.
- According to A.J. Forsyth, this landscape treatment would not have happened if it had not been initially mandated by the City. The cost for the landscape plan and installation was about \$130,000, which represents a substantial investment in infrastructure (equivalent to buying another crane for their warehouse). Despite the cost, the Branch Manager felt that the company would do it again given the benefits to the site environment, community image and corporate pride.

Key Players

A.J. Forsyth a Division of Russel Metals Inc. - John Johnson, Branch Manager and Allan Smith, Regional Manager -

http://www.russelmetals.com/english/service/operations/canada/forsyth_details.html#nanaimo

JPH Consultants Ltd – Pat Harrison, MBCSLA, Principal <http://www.jphconsultants.ca/>

Aries Construction Management Ltd – Greg Hoover, President <http://www.aries-construction.com/Nanaimo.html> (this website includes images and a slide show of building construction on the A.J. Forsyth site)

City of Nanaimo – Gary Noble, Development Approval Planner, Development Services Dept.

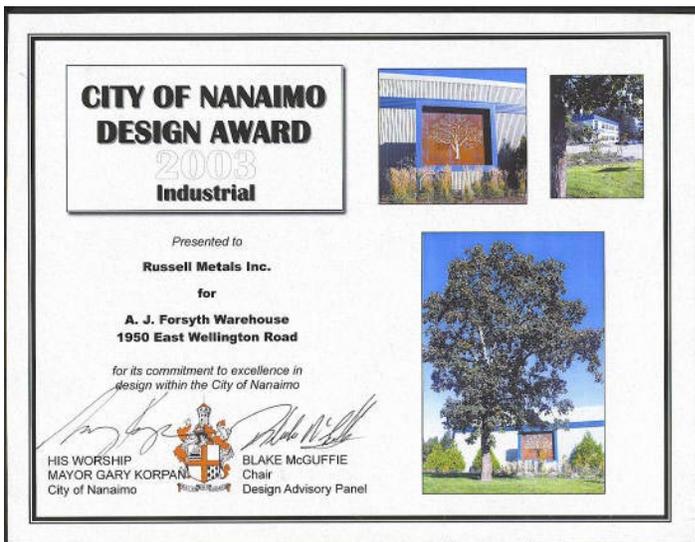
<http://www.nanaimo.ca/>

² Harrison, P. 2005.

Site landscaping (courtesy of Aries Construction Management Ltd)



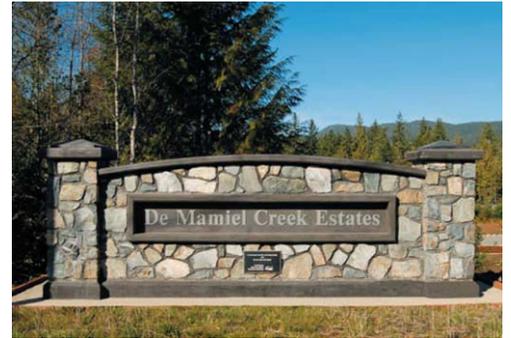
Design Award (courtesy of A.J. Forsyth)



De Mamiel Creek Estates, Sooke

Highlights

- ◆ Site design (*DwC Section 3.5.1*)
- ◆ Riparian setbacks and buffers (*DwC Section 4.4.2, 4.5.2*)
- ◆ Development away from terrestrial hazards (steep slopes) (*DwC Section 2.8.2*)
- ◆ Conservation covenants (*DwC Section 4.5.2, Appendix E*)
- ◆ Stream protection (*DwC Section 4.5.2*)
- ◆ Stormwater management (*DwC Section 3.6.1*)
- ◆ Homeowner stewardship (*DwC Section 3.5.3, fact sheet #8*)



Background

De Mamiel Creek is a rural residential subdivision located on Otter Point Road north of Sooke (Figure 1). This development is on a 50 hectare (129 acre) site bisected by De Mamiel and Rocky Creeks. De Mamiel Estates Ltd., led by Laurie McBride, Wally Vowles and Thomas Townsend, has been developing this site since 2003. Three phases (30 lots) have been completed and a fourth and final phase with 20 additional lots is underway.

Figure 1: Location Maps

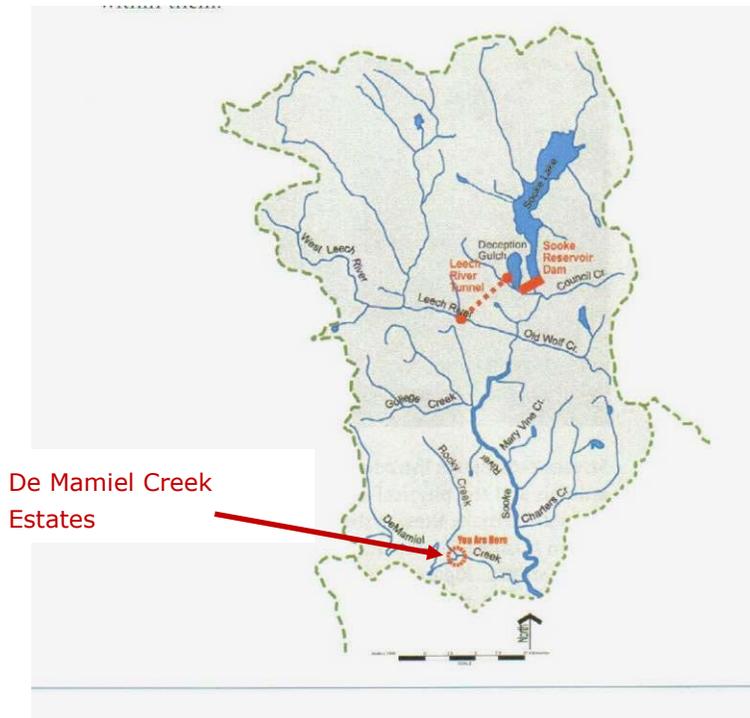


Environmentally Valuable Resources

De Mamiel and Rocky Creeks are productive salmon streams in the Sooke River watershed (Figure 2). They are two of the most significant Coho streams on southern Vancouver Island, and also support populations of trout, steelhead and chum. There is a salmon hatchery upstream on Rocky Creek. The riparian vegetation on both Rocky and De Mamiel Creeks is mixed forest with second growth coastal Douglas fir forest on the upper slopes. Flood plain areas near the confluence of the two creeks and near the braided channel areas of Rocky Creek are comprised of salmonberry thickets.

The banks of the creek are high and steep in most areas, in some places up to 21 m (70 ft) high. There is bank undercutting in places, increasing the terrain hazard.

Figure 2: Sooke River Watershed



Local Government Requirements

This site is under the jurisdiction of the Capital Regional District (Juan de Fuca Electoral Area). The minimum allowed lot size for development in this area is 1 hectare (2.47 acres). A Development Permit Area (DPA) applies to lands within 30 m either side of De Mamiel Creek, with the following conditions:

- ◆ No removal of sand, gravel or soil from the watercourse;
- ◆ Planting and retention of trees and vegetation required;
- ◆ No permanent structures within the floodplain;
- ◆ For lots adjacent to the creek, septic fields are to be placed between the building and the road; and
- ◆ Surface water drainage to be managed in accordance with *Stormwater Planning: A Guidebook for British Columbia*.

There is no DPA for Rocky Creek.

More than 18% of the site was within the Development Permit Area. After negotiation, the developer was allowed to create smaller lots (0.8 ha). This was achieved through a re-zoning of the site that provided for a lot size reduction of up to 20% less where amenities (fish habitat protection and dedication of park land) were provided. This enabled the developer to retain the same number of lots on the development site, while setting aside about 10 ha (20% of the site) under monitored Conservation Covenants.

Local groups suggested that the riparian area be set aside as public parkland, but this was not accepted by the developers as it did not provide the long term protection for the riparian values that they envisaged. The developers reasoned that these environmentally sensitive

lands under private, monitored, ownership afforded the greatest protection for the riparian area and the salmonid resource.

Implementation of Develop with Care Guidelines

Riparian setbacks and buffers, development away from hazard lands



Some parts of the creek have steep or undercut banks.
Photo courtesy De Mamiel Estates Ltd.

A fisheries technician (Jason Byrne) identified environmentally sensitive areas (ESA) where development should not occur. Land Development Guidelines were used to define the environmentally sensitive area for fish habitat. The top of bank was considered to meet the requirements for protection of fish habitat where long stable banks were present. For unstable banks, the top of bank plus the 15 m recommended by the Land Development Guidelines was used, and a geotechnical assessment was conducted.

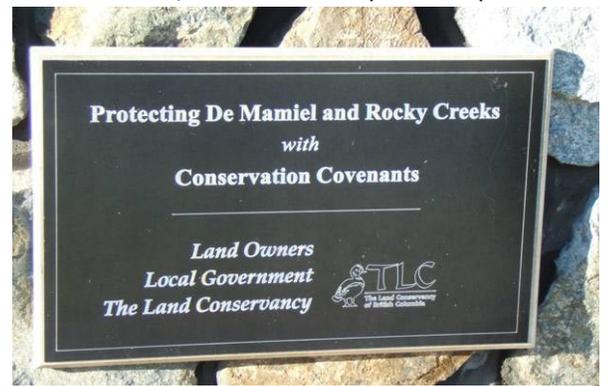
The key factors considered when recommending the ESA were:

- ◆ protecting critical pool habitats from further reductions in summer flows and stream changes resulting from increased peak winter flow or stream crossings;
- ◆ protecting riparian vegetation to shade the stream channel during dry summer periods;
- ◆ allowing for recruitment of large woody debris by protecting mature forests along stream banks; and
- ◆ maintaining habitat complexity.

This information was combined with the 30 m DPA, and the greater of the two distances was used to define the riparian protection area. This protection area was placed under Conservation Covenants (see below). The buffer is at least 30 m wide, and in some places up to 50 m. For the most part, the protection area also includes the hazard lands.

Conservation covenants

The riparian protection area was placed under three-way Conservation Covenants between the landowner, TLC The Land Conservancy and the Capital Regional District (Figures 3 and 4). Lots were sold with the conservation covenants in place.



Sign at subdivision entrance.
Photo Judith Cullington

A baseline survey, including vegetation plots and mapping of ecological communities, was conducted for each lot prior to sale. This included identifying the covenant boundary and points for photopoint monitoring. Where possible, the TLC meets with the new landowner to discuss the covenant terms and build a relationship. TLC then monitors the lot annually using photopoint monitoring. The developer paid for the baseline survey, and has established an endowment fund to cover the costs of annual monitoring.

The covenants prohibit any activity that 'may have a detrimental impact' in the covenant area such as:

- ◆ The cutting or pruning of live or dead trees;
- ◆ The building of structures (e.g., sheds, gardens, weirs);
- ◆ Alterations to the watercourse; and
- ◆ Deposition of fill or the removal of soils or rocks.

The owner is allowed to build a small footpath to the creek.

There are onerous penalties for breaking the conditions.

Parkland dedication

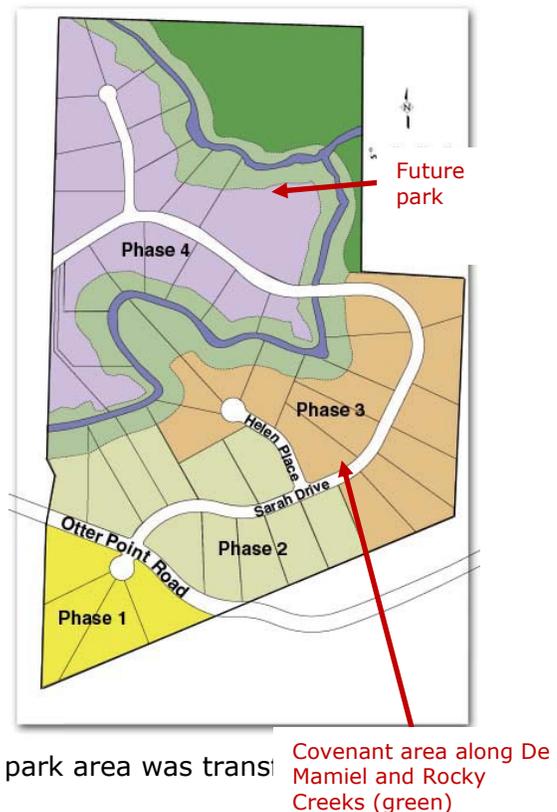
In addition to the covenanted private lands, an additional 2.8 ha (7 acres) has been set aside as public parkland (Figures 3 and 4). To avoid having lots that crossed the creek, the developer is gifting this land to the Juan de Fuca Parks and Recreation Commission. In return, the allowable density for the park area was transferred to the development site.

The park site has been used as a gravel pit, and rehabilitation will take place before the land is turned over as a park. The developer was also required to make a contribution to the parks acquisition fund.

Stormwater management

A stormwater management plan was designed to use integrated surface water management practices to protect the creek from changes to water flow that might harm the creek. These followed the principles of on-site infiltration for groundwater recharge, and detention of overland flows to improve the water quality. Runoff from roofs and paved areas was directed to on-site infiltration areas using drain rock, and homeowners were encouraged to construct driveways using permeable paving materials. The Stormwater Management Plan is registered with the local government, and any changes to this plan can only be made under the direction of a professional engineer.

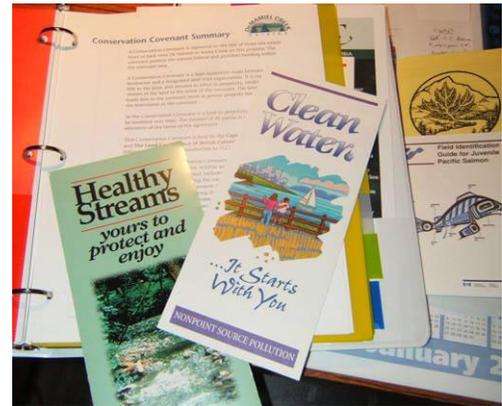
Figure 3: Lot layout



Homeowner stewardship

The developer provides a comprehensive homeowner's manual to help new owners understand their obligations as stewards. This was created as a result of TLC The Land Conservancy stating that the Covenants are most effective when an educated homeowner understands their intent and supports the concept. The manual includes information on:

- ◆ The creek and salmonids;
- ◆ Onsite stormwater management, and stewardship information on avoiding runoff and water pollution;
- ◆ The covenant and TLC;
- ◆ Tips on naturescaping and invasive species management; and
- ◆ A summary of the Development Permit.



Homeowner manual and inserts

Restoration

The limiting factor to productivity of salmonids in De Mamiel and Rocky Creeks is primarily low summer flows. Several opportunities for ground water channels were identified to increase summer rearing habitat for Coho. In addition sedimentation and erosion control measures were discussed as well as limiting any increase to peak flow during flood season. Specific enhancement/compensation strategies were to be included in future development permit applications if required.

Benefits

- ◆ The residents have guarantees that the forested nature of the subdivision will be preserved in perpetuity.
- ◆ The riparian area and salmon habitat are protected.
- ◆ The Conservation Covenant provides greater security than the DPA alone, as ongoing monitoring is provided. The covenants also protect Rocky Creek, which is not included in the DPA.

Lessons Learned, Other Considerations

- ◆ For the developer, there were considerable costs (~\$50,000) involved in doing the surveys and legal work required to identify and create the covenant areas, as well as a delay of some 10 months in getting approvals. A more streamlined and supportive approach from the local government would have been helpful.
- ◆ There was resistance to the idea of Conservation Covenants from the local community. This arose from:
 - ◇ A lack of understanding of the difference between a Conservation Covenants and a unenforced Section 219 Restrictive Covenant;
 - ◇ Bad experiences with some previous developments where the Restrictive Covenant was later rescinded or modified by the local government to allow for development; and
 - ◇ Covenants that were not monitored or enforced.

The three-way Conservation Covenant provides long-term protection and is much harder to change, as well as providing annual monitoring of the site. However, the difference was not well understood by the public.

Contacts

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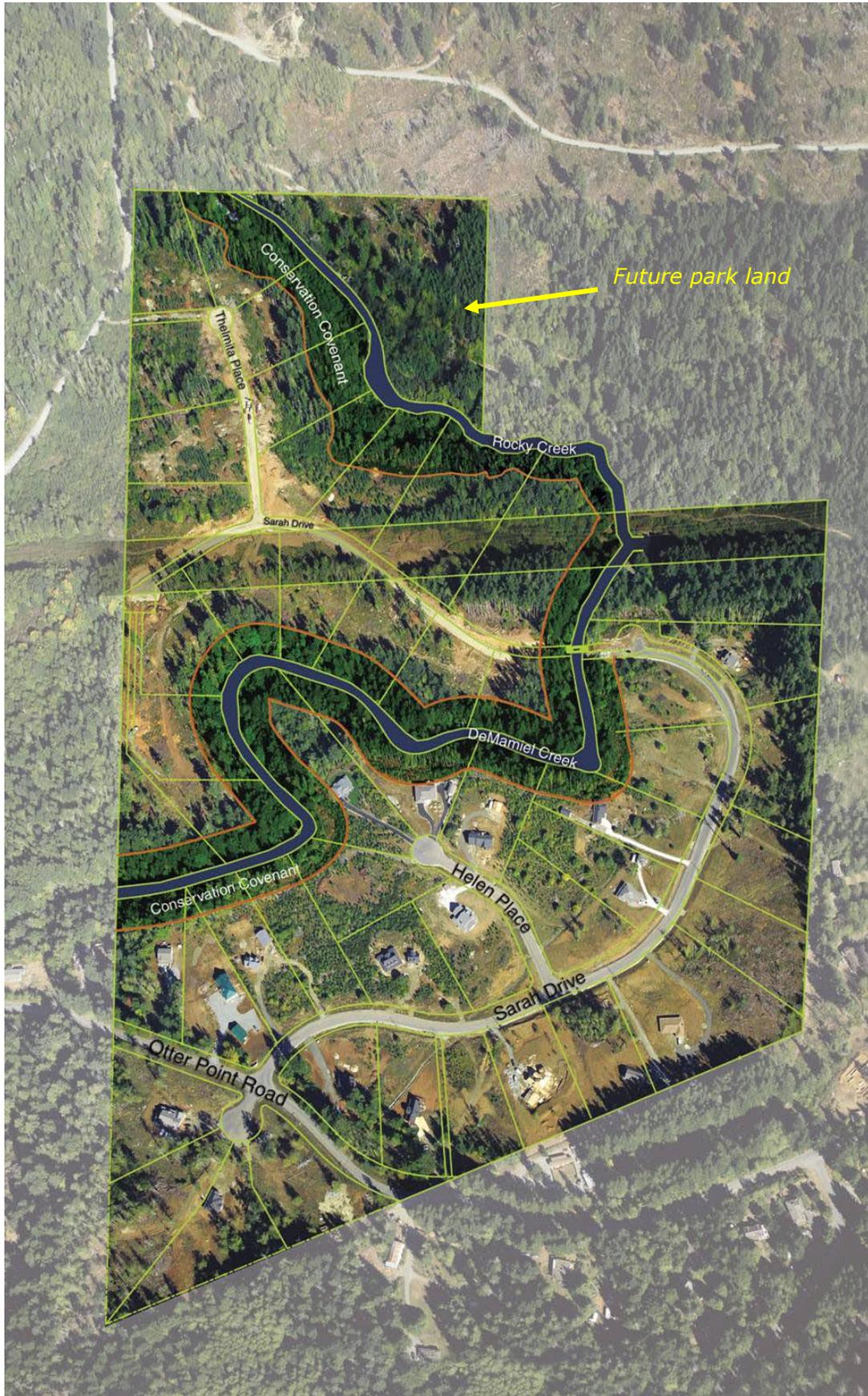
Jason Byrne

Fisheries Technician



Photos courtesy De Mamiel Estates Ltd., Judith Cullington

Figure 4: Aerial View (courtesy Reber Creative)



Mattick's Wood, Saanich

Highlights

- ◆ Clustering (*DwC page 3-16*)
- ◆ Retention of urban forest (*DwC page 2-27*)
- ◆ Ecosystem protection during construction (*DwC page 3-20*)
- ◆ Native landscaping (*DwC page 3-21*)
- ◆ Audubon-certified golf course (*DwC fact sheet #9*)

Background

Mattick's Wood is a 40 lot single family residential subdivision located off Cordova Bay Road in Saanich (Figure 1). Building started in 1998.



The site was formerly part of Bill Mattick's Farm. The Jawl family have developed Mattick's Wood as part of a larger comprehensive development that includes Mattick's Green (32 condo units in two buildings), Mattick's Farm (commercial and business units), the Cordova Bay Golf Course, and the new Sayward Hill development (202 condo units and townhouses on the west side of the Cordova Bay Road). For Mattick's Wood, the developer (MacArthur Park Estates Ltd.) wanted to create something "more than just another subdivision", something with "good taste, uniqueness and ecological integrity." Franc D'Ambrosio (then of de Hoog + D'Ambrosio architects) was hired as the architect and project lead.

Figure 1: Location Maps



Environmentally Valuable Resources

Prior to development, there were five houses in Mattick's Wood, but much of the property was used as a "dumping ground with a communal empty field." There were remnants of older second growth forest with intact understorey throughout the development site.

Municipal Requirements

The District of Saanich required an Environmental and Social Review as a condition of re-zoning. This involved a variety of assessments by a landscape architect, architect, civil engineer and arborist (at the developer's expense).

The development was subject to a special-purpose detached single-family residential zoning bylaw that regulated minimum lot size, density, maximum building area and maximum building height.

Implementation of Develop with Care Guidelines

Clustering

Almost half of the allowable density for the development site was placed in two four-storey condominium buildings (Mattick's Green) on lands that had been previously disturbed.



Mattick's Green

Forty small lots for single family houses were created in the remaining, more forested area. Figure 2 shows the development plan and an aerial photo of the site today. Building footprints were kept compact and clustered, and roads and driveways were minimized. This allowed as much as possible of the natural landscape to be kept intact.

Retention of urban forest, protection during construction

Each building lot was surveyed to determine the best location for the building footprint. The forested portion of each site was designated as a 'preservation zone' and placed under a Restrictive Covenant managed by Saanich. The zoning bylaw defined the house position and the preservation zone, and the lot was sold subject to design guidelines for the site and the terms of the covenant.

The design guidelines specified that:

- ◆ Building foundations and edges should be placed outside of main tree root systems. Excavation, backfilling and paving within the surface area of main tree root systems were to be avoided.
- ◆ Contractors would be monitored to "ensure that trees and other vegetation are given maximum protection and consideration during construction."
- ◆ Where trees and understory outside the preservation zone were removed, they had to be replaced with native plants (a list of suitable plants was provided).
- ◆ Trees were not to be topped for the purpose of gaining views. Selective tree removal and windowing would be permitted, subject to Saanich certified arborist's supervision.



Temporary fencing to protect trees and roots from construction damage

A low-shock dynamite was used where needed for blasting, to minimize impact to tree roots.

There was initial resistance to the Restrictive Covenants from some potential buyers, but current residents appreciate the resulting 'look' of the area which is characterized by forest.

Figure 2a: Development Plan (courtesy D'Ambrosio architecture + urbanism)



Figure 2b: Aerial View 2005 (courtesy Natural Areas Atlas)



Alternative development standards

Subdivision roads are only 6 metres wide. This is below the minimum allowed by Saanich so they are private roads. The road sub-grade is compacted gravel and a layer of sand to support and 'set' the concrete semi-permeable pavers, allowing rainwater to seep through. Some lots use open pavers so that the front lawn doubles as a parking area.

Rather than create a second road for emergency access, the development uses an unpaved former logging road which doubles as a community trail. Wildflowers are allowed to grow along the centre of this road. The local fire department agreed to accept this alternative after they found they were able to negotiate this road with their trucks.

Natural landscaping

The design guidelines specify use of native, drought-tolerant species, and minimal to no lawn area. "Excessively manicured" landscapes are discouraged. Where trees and ground cover were removed for building, they had to be replaced with native species.



Natural landscaping, small lawns



Golf course

The Cordova Bay Golf Course was the first course on Vancouver Island to receive Audubon certification. This began with an inventory of current and potential environmental values.

Some of the measures taken to earn this recognition were:

- ◆ *Reducing water use.* A new irrigation system uses 45 gallons/minute (the old system used 55 gal/min) and provides a more even spray. This has reduced water use by 25%, and reduced the electricity required for pumping.
- ◆ *Use of stormwater runoff.* The stormwater from the Sayward Hill development is directed into man-made ponds. These ponds double as a water feature for the development and golf course, and the water is used throughout the summer for golf course irrigation. The ponds also attract waterfowl.
- ◆ *Habitat restoration.* More than 3 ha of the golf course have been naturalized, and there are 37 native plant gardens. Standing dead snags are left as wildlife trees. Nesting boxes have been installed for purple martins and other birds, as well as bat boxes and boxes for mason bees. Ponds are stocked with fish to attract herons.
- ◆ *Reduction in pesticide use.* Insecticides are now banned, and plants are chosen to be pest resistant and stress tolerant. Native species (such as snowberry and Oregon grape) are used where possible. 'Compost tea' (made from grass clippings, leaf matter and restaurant food waste) is used for fertilizer.



Red-breasted sapsucker, as shown in golf course newsletter, with tips on how to spot this and other birds.

- ◆ *Outreach and education.* The golf course sends a monthly newsletter to golfers and neighbours that provides information on their environmental practices, and tips (e.g., how to make compost tea or attract birds to their yards). They have been working with neighbours to increase their backyard habitats, for example with bird boxes and brush piles.

These measures have resulted in increased biodiversity (the bird count has gone from 61 to 71 species). There have also been economic benefits for the golf course, including a savings of \$10,000 per year on fungicides. The golf course superintendent (Dean Piller) has become a keen advocate of the benefits of this approach, and is inspiring other local golf courses to consider Audubon certification.

Benefits

- ◆ Residents like the privacy of the urban forest ambience, and house prices for this subdivision have skyrocketed. According to Karen Jawl, "The uniqueness of the site is the attraction; there is no competitive pricing because there is no site comparison."
- ◆ The developer and architect are very proud of this development which has been cited as a model of 'good' development by municipal staff and local community groups.
- ◆ This development offered a "lighter footprint with higher yield than the zoning allowed for. The result is the same economic value with higher ecological value" according to architect Franc D'Ambrosio.
- ◆ The close proximity and connection through walkways and bike paths to shops, groceries, restaurants, medical and other services provides Mattick's Wood residents with car-free transportation choices.

Awards

- ◆ The arborist won an award from the District of Saanich for tree retention.
- ◆ The golf course received a 2005 Environmental Award from the District of Saanich.
- ◆ The multi-family buildings were received a C.A.R.E. (Construction Achievements and Renovations of Excellence) award from the Canadian Home Builders' Association.

Lessons learned

- ◆ Setbacks for the covenants were too close to the house, meaning that many owners sought permission to adjust the covenants to allow them to put a deck or picnic tables in their back yard.
- ◆ At the time of sale, there was considerable resistance from potential buyers regarding the design guidelines, small lot sizes and inability to use the covenanted areas. There was also less interest in this type of development at that time (late '90s). Now, residents and potential buyers appreciate the uniqueness of the subdivision and prices have soared. Neighbours help to police each other with respect to adhering to the design guidelines.

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Mattick's Wood: urban forest retention



Mattick's Wood: covenants protect trees and ground cover close to houses



permeable paving, some off road parking areas use grass pave



Mattick's Wood: tree retention and trail through Wood



development and store it for use on the golf course



Mattick's Wood looking to golf course

¹ All photos courtesy Judith Cullington unless otherwise noted

BC Riparian Areas Regulations Five Assessment Report Case Studies

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1.0 Introduction

The Riparian Areas Regulation (RAR)¹, enacted under Section 12 of the Fish Protection Act², in July 2004, calls on local governments to protect Riparian Areas during residential, commercial, and industrial development by ensuring that proposed activities are subject to a science based assessment conducted by a Qualified Environmental Professional (QEP). In developing this new regulation, the Ministry of Environment (MoE) has worked in collaboration with the Union of British Columbia Municipalities (representing local government interests) and the Department of Fisheries and Oceans (DFO).

In response to the large number of enquiries received by MoE regarding the implementation of the RAR and the high percentage of RAR Reports submitted with deficiencies, the MoE's Nanaimo Regional Office (Region 1) planned a series of educational workshops, to be held throughout the province where the RAR is in effect. These workshops were designed to illustrate the correct application of the RAR. The intended audience for the workshops consisted of the development community, QEPs and staff from local governments.

2.0 Background

The Riparian Area Regulation (RAR), enacted under the BC Fish Protection Act, required local governments to protect riparian areas by March 31, 2005. The deadline for local governments to implement the RAR was subsequently extended to March 31, 2006. The BC Ministry of Environment (MoE) receives numerous enquiries on the requirements under the RAR from: clients in the land development business (developers, realtors, engineers, etc); Qualified Environmental Practitioners (QEPs) called upon by developers to conduct the RAR Assessments; and from local governments (municipal and district). During a phase-in period, of indeterminate length, 100% of RAR Assessment Reports (RAR Reports) submitted using the electronic notification system are being reviewed by staff from the MoE and/or the DFO. Reviews by MoE and DFO staff to date indicate that only a small portion of the RAR Reports submitted meet the RAR reporting criteria.

In preparation for the above mentioned workshops, the Ministry developed five case studies that together illustrate the correct application of the RAR. The five case studies highlight the strengths and weaknesses of the RAR Reports submitted to date. This review is not meant to single out particular developers, QEPs or local governments as being either particularly adept or incapable with respect to the application of the RAR. These case studies feature a range of waterbody and development types.

To complement the text of this report, a series of PowerPoint slides were developed that highlight the strengths and weaknesses of how the RAR has been applied to date on a site-by-site basis. The PowerPoint presentation contains images (Site Plans, photographs of the Sites, etc.) that were not reproduced for this text-only version of the review. The five Case Studies are presented in the same order in both this text-only version and the PowerPoint presentation version. The reader

¹ BC Regulation 376/2004 with amendments to May 2006; see URL <http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/riparian_areas.html>

² BC Bill 25/1997; see URL <http://www.env.gov.bc.ca/habitat/fish_protection_act/act/documents/act-theact.html>

may find it useful to view both documents at the same time so that images relevant to the discussion can be viewed.

As of January 31, 2007, approximately 250 RAR Assessments have been filed using the electronic notification system³. The exact number is difficult to determine because a large number of the revised RAR Reports are submitted using a new Assessment Number. Two regions are responsible for producing the vast majority of RAR Reports. MoE Region 1 – Vancouver Island has seen approximately 130 reports filed and MoE Region 8 – Okanagan has seen approximately 70.

3.0 Assessment Report Selection Process

The selection process for choosing the five RAR Reports used in the case studies was broken into two steps. First, using Development Type and Stream/River Type as the primary selection criteria, a list of 20 candidates was selected from the approximately 130 RAR Reports submitted for developments within Region 1 – Vancouver Island. In step two, each of the 20 RAR Reports selected in step one was ranked using additional criteria, as outlined below. Following a meeting with staff from Trow Associates Inc., MoE, and DFO this ranking was used to guide the selection of the final five.

3.1 Selecting Twenty Candidate RAR Reports

The selection process was structured to include RAR reports from as many different Development Types and Stream/River Types as possible. These two report parameters became the primary selection criteria for selecting 20 RAR Reports that would be reviewed in greater detail in step two of the process. The Development Type parameter included:

- Recreational;
- Subdivision – six lots or less single family lots;
- Construction – single family residential;
- Construction – light industrial or commercial; and
- Landscaping.

The Stream/River Type parameter included:

- Lake;
- Wetland;
- River - >5 metres average width;
- Stream - < 5 metres average width; and
- Ditch.

The 130 reports in the system for Vancouver Island were sorted by Development Type, and then within each Development Type, re-sorted by Stream/River Type. Those RAR Reports that meet the selection criteria were added to the list of 20.

³ See URL <<http://srmapps.gov.bc.ca/apps/rar/>>

These 20 RAR Reports were then ranked using criteria based on a MoE document which outlined ten common mistakes noted in the RAR reports reviewed to date. A sum-of-scores approach revealed which RAR Reports were favoured for use in a case study. The ten selection criteria were:

- Completion of all sections of RAR Report;
- Correct application the Simple Assessment methods;
- Correct determination of HWM for waterbody (particularly for lakes or wetlands);
- Justification provided when default values not used;
- Inclusion of all required components in the Site Plan;
- Completion of all measures (Reports using Detailed Assessment methods only);
- Inclusion of Secondary QEP opinions when appropriate (Detailed Assessments only);
- Use of precise and site-specific language in Methods, Measures and Monitoring Sections of Report;
- Inclusion of Post-development Reporting details; and
- Selection of correct Profession Opinion in Section 7 of RAR Report.

3.2 Selecting the Five RAR Reports for the Case Studies

The selection of the five RAR Reports that would be used in the development of the case studies was accomplished in a meeting with Trow staff and representatives from MoE and DFO. The rankings based on the above criteria were used to guide the discussion. Consequently it was decided that, since the workshops would be held throughout the province it would be appropriate to include one or two RAR Reports from developments within Region 8 – Okanagan. At the meeting a list of five candidate RAR Reports from the Okanagan was reviewed and two were selected to be developed as case studies. Three more RAR Reports were selected from the list of 20 candidates based on the rankings determined as described above.

4.0 The Case Studies

These five RAR Reports were then used as the baseline for a “case study” of approximately 3 to 5 pages in length. The case study report included a summary of the development, a summary of the RAR Assessment and a review of the strengths and weaknesses of each specific RAR Report. To enhance our understanding and background of each example, correspondence, checklists and site visit notes were made available by MoE staff for review. The inclusion of data that may identify the developer, or QEP(s) was avoided. No attempts were made to verify the accuracy of some components of the RAR Assessments, including:

- stream variables such as reach grade or distance between HWMs;
- HWM and TOB locations; or
- TOB to permanent structure measurements.

Following are the five case studies.

4.1 Case Study One

4.1.1 Background

The Riparian Areas Regulation Assessment Report (the RAR Report) reviewed for Case Study One was originally submitted to the BC Ministry of Environment (MoE), Region 8 – Okanagan on August 31, 2006. It was returned to the authoring Qualified Environmental Practitioner (QEP) on September 15, 2006 with comments from MoE and Department of Fisheries and Oceans (DFO) reviewers. The QEP submitted a revised edition of the RAR Report on September 18, 2006 and was then deemed to have met the RAR reporting criteria.

This RAR Report represents an excellent example of an Assessment completed using the Detailed Assessment Methods. The Site Plan in particular should be singled out as a model for what is required when submitting a RAR Report to the MoE electronic notification system.

The development proposal was for the construction of a multi-family residence (condominium hotel and townhomes) on a 1.71 hectare lot (the Site) neighbouring and adjacent to the shore of Osoyoos Lake, in the Town of Osoyoos. As identified in the RAR Report, Osoyoos Lake provides habitat for approximately twenty species of fish, but the condition of the subject property was judged to have only a minor influence on the quality of littoral fish habitat due to the existence of municipal parkland lying between Osoyoos Lake and much of the subject property. Recent photographs of the Site show it to be largely cleared, covered by bare earth, former building foundations and spotty low herbaceous growth. The north portion of the subject property was lightly treed, with less bare earth and more complete low herbaceous growth. This Site is surrounded by a mix of commercial and residential development.

4.1.2 Assessment Report

The RAR Report as initially submitted was substantially complete and of very good quality, but was returned to the author for two main reasons: 1) absence of parcel identifiers (PIDs) for the lots making up the subject property; and 2) Measures for Windthrow and Slope Stability were not included.

4.1.2.1 Tombstone Data

The Tombstone Data area of the RAR Report was complete except for missing PIDs for the nine lots comprising the Site. The PIDs were included in the second version of the Report, submitted on September 18, 2006. The developer typically possesses several documents containing the PIDs for their holdings. The certificate of title, the annual assessment and the land tax notice, all contain PID information.

No additional errors or omissions were noted in the Tombstone Data area of the report.

4.1.2.2 Assessment Data

Section 1 of the Assessment Report is a Description of the Fisheries Resource Values. This section should include a summary of species present in the waterbody, fish habitats present, and condition of riparian vegetation. The Fisheries Resource Values section in this RAR Report was covered very well, describing in detail: fish species present; fish habitats adjacent to and

neighbouring the Site; and riparian vegetation of both the Site and the municipal park that lies between Osoyoos Lake and much of the Site. Third-party references supporting the observations and opinions of the QEP were provided.

Section 2 for this RAR Report outlined the results of the single Detailed Assessment required for the Site. Since the waterbody in question for this Assessment was a lake, the QEP needed only to determine site potential vegetation type (SPVT) and calculate the three zones of sensitivity (ZOS). Both the large-woody-debris-bank-and-channel-stability (LWD) ZOS and the litter-fall-insect-drop ZOS were correctly calculated to be 15 metres. Due to the largely north-south orientation of the lake shore, the shade ZOS was demonstrated to be between zero and 7.2 metres. The Shade ZOS was correctly determined by dragging (in computer drafting space), the high water mark (HWM) line of the lake, due south by a distance determined from consulting Table 3-5 in the Assessment Methods⁴.

Section 3 contains the Site Plan for the proposed development. For a RAR Report filed using the Detailed Assessment Methods, the Site Plan must:

- Be of a suitable size and scale to show necessary details (local government usually stipulates the size for plans submitted with development applications);
- Contain a legend, a north arrow, and a scale bar;
- Show the proposed subdivision boundaries or outline of elements to be constructed;
- Show the waterbody (waterbodies);
- Show the Riparian Assessment Area (RAA);
- Show the HWM of the waterbody (waterbodies);
- Show the ZOSs for the waterbody (waterbodies); and
- Show the resulting Streamside Protection and Enhancement Area (SPEA).

The Site Plan as initially submitted with this Report was very well done. The only element missing was the Riparian Assessment Area. The information necessary to illustrate the RAA, namely the line indicating the 30 metre setback from the HWM of the lake, was present, however it was not clearly communicated that the area between the 30 metre setback and the HWM constituted the RAA. The figure, as imbedded in the pdf and uploaded to the RAR Notification Systems, was designed for printing on ledger-size paper and it included a scale bar that would allow any subsequent reviewer to scale the Site Plan at whatever size they chose to print it at.

4.1.2.3 Measures, Monitoring & Plans for Post-Development Reporting

Section 4 covers measures that may need to be taken to protect and maintain the SPEA. Eight measures are outlined in the Assessment Methods and are listed below:

1. Danger Tree Assessment
2. Windthrow Assessment

⁴ BC Ministry of Environment. 2006. Assessment Methods – Schedule to BC Riparian Areas Regulation (B.C. Reg. 376/2004, revised May 2006). Province of British Columbia, Victoria, BC.

3. Slope Stability Assessment
4. Tree Protection Plan
5. Plan to Prevent Encroachment in the SPEA
6. Sediment & Erosion Control Plan for construction of development
7. Stormwater Management Plan
8. Floodplain Assessment

For a given development proposal it is possible that not all Measures need be developed. A site that is devoid of trees would not require a Danger Tree Assessment. It is however necessary for the QEP to address all the Measures, even if for some Measures this simply means stating that they are not applicable to the Site. If the QEP simply omits measures that he/she feels do not need to be addressed, then the RAR Report will likely be returned as incomplete. This RAR Report was returned, in part, because Measures for Windthrow and Slope Stability were not included in the original submission. In the September 18, 2006 resubmission the QEP simply added "Not an issue", under the headings for these two Measures. This was apparently sufficient to meet the RAR reporting criteria.

The Measures that were developed contained specific instructions that would make it easy for the developer to implement the necessary protective programs. The Measures could have been improved by the inclusion of timelines for the establishment of key components of the protective actions prescribed. This shortcoming will likely be compensated for by the inclusion of extensive Environmental Monitoring provisions. The RAR Report stipulates that a project environmental monitor, in charge of protecting the SPEA during the construction period, is to be retained by the developer. This environmental monitor will likely ensure that protective actions are taken at appropriate times during the construction project.

In Section 5 of the RAR Report, it is intended that the QEP prescribe monitoring activities that are to take place before, during and immediately after the development activities. For this RAR Report the authoring QEP indicates that a QEP will be retained by the developer to act as a project environmental monitor. This monitor will direct regularly scheduled inspections that will have the goal of ensuring that:

- The SPEA is respected;
- Protective measures (flagging, silt fencing, etc.) are effective;
- Restorative plantings are surviving; and
- Storm water management is working.

Section 5 also included a statement directing the developer to have a QEP complete and file a post-development report when the project is finished. The post-development report contains an assessment of how successful the Measures were at protecting the SPEA from harm.

Section 6 contains well captioned photographs of the Site at the time of the Assessment. The photographs included in this RAR Report were a useful addition. They covered the entire Site and complemented the Site description included in the Fisheries Resources Values section and could have been used by the QEP to justify the omission of Measures for Windthrow and Slope Stability.

4.1.3 Conclusion

The final component of the Assessment Report (Section 7) requires that QEP(s) involved in completing the Assessment, provide their professional opinion on the development proposal. QEPs need to certify that they are qualified to carry out the assessment, and that they have carried out an assessment as per the methods set out in the Schedule of the Riparian Areas Regulation. They then need to provide their professional opinion(s) that either:

- a) if the development is implemented as proposed by the development proposal there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area in the which the development is proposed, or
- b) if the streamside protection and enhancement areas identified in this Assessment Report are protected from the development proposed by the development proposal and the measures identified in this Assessment Report as necessary to protect the integrity of those areas from the effects of the development are implemented by the developer, there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area in which the development is proposed.

In this instance the two QEPs selected and signed the correct opinion, the latter one. This is the correct opinion in instances where no works are planned within the SPEA.

With exception of the missing PIDs and Measures, this RAR Report is representative of the general quality and substance required when submitting a report to the RAR notification system.

4.2 Case Study Two

4.2.1 Background

The RAR Report reviewed for Case Study Two was originally submitted to the BC Ministry of Environment, Region 8 – Okanagan, on December 6, 2006. It was returned to the authoring QEP on December 20, 2006 with comments from a MoE reviewer. The QEP submitted a revised edition of the RAR Report on January 16, 2007. It appears that the QEP has addressed the shortcomings of the original submission and the revised RAR Report will likely meet the RAR reporting criteria.

This RAR Report represents an excellent example of an Assessment completed using the Simple Assessment Methods. The report was complete as originally submitted and contained very good examples of what the MoE is looking for in terms of the figures that are to be included in a Simple Assessment.

The development proposal was for the construction of a high-density multifamily residential building on a 0.269 hectare lot bordering Pentiction Creek in the City of Pentiction. Pentiction Creek supports at least three salmonid and one non-salmonid fish species. Pentiction Creek in the vicinity of the Site is channelized and lined with concrete and rip-rap. The existing riparian vegetation in the vicinity of the Site is comprised of a thin band (0 to 30 metres wide) containing cottonwoods, Douglas fir, Ponderosa pine and grasses.

4.2.2 Assessment Report

The RAR Report, completed using the Simple Assessment Methods, was substantially complete and of generally good quality but was returned to the author for two reasons: 1) incorrect use of high water mark (HWM) in determining the vegetation category, resulting in an incorrect SPEA and Site Plan; and 2) signing the wrong professional opinion.

4.2.2.1 Tombstone Data

The Tombstone Data is that information entered on the first page of Form 1. Form 1 is the template that once correctly filled out, makes up the completed Assessment Report. Details of the primary QEP, secondary QEP(s), the developer, the proposed development and the location of the proposed development are required here. For this RAR Report, this section was complete and the MoE reviewer did not identify any errors.

4.2.2.2 Assessment Data

Section 1 of the RAR Report (Description of the Fisheries Resource Values) was well done for this Assessment, including a summary of species present in Penticton Creek, fish habitats present, and the condition of riparian vegetation. For Reports that are completed using the Detailed Assessment Methods, this information is useful to the QEP when it comes time to determine the Measures that will be necessary to protect the integrity of the SPEA. For Reports, such as this one, that are prepared using the Simple Assessment Methods, the Fisheries Resource Values section provides important background information required by the QEP to support decisions made regarding the fish-bearing status and permanence of the waterbody.

The results of the Riparian Assessment are found in Section 2. For this Report, a single assessment was completed using the Simple Assessment Methods. The main components of the Simple Assessment are: 1) determining the status of existing and potential vegetation (Vegetation Category); 2) determining if the stream is fish-bearing; and 3) determining stream permanence. Determining the status of existing and potential vegetation is completed by calculating the average distance from waterbody top of bank (TOB) to first permanent structure along a 400 metre section of the waterbody, centered at the subject property. This is accomplished using a suitably scaled (> 1:2000) aerial photograph or orthophoto. Field checks are often necessary to confirm the location of the TOB and permanent structures that are obscured by vegetation.

It is important to note the distinction between TOB, used for assessments completed using the Simple Assessment Methods and HWM used for assessments completed using the Detailed Assessment Methods. TOB is a term that land surveyors will be very familiar with, as it refers to "...the point closest to the boundary of the active floodplain of a stream where a break in the slope of the land occurs such that the grade beyond the break is flatter than 3:1 at any point for a minimum distance of 15 metres measured perpendicularly from the break...". This distinguishes TOB from HWM which is best determined using physical clues such as changes in the characteristic of riparian vegetation, and evidence of scouring or deposition.

The QEP conducting this Assessment felt that the highly altered nature of the creek channel, and recent changes to the location of TOB due to emergency stream works completed by the City of Penticton, would make the HWM a more consistent indicator of the stream edge. The MoE reviewer did not agree, and requested that the QEP redo the Assessment based on TOB, as

prescribed in the Methods. The measurements required to calculate Vegetation Category were redone, from the TOB, but were not significantly different from the ones done from the HWM to change the Vegetation Category (1). The SPEA width remained at 15 metres, but was shifted several metres away from the creek, when it was laid out starting as the TOB.

Section 2 must include an aerial photograph or orthophoto of the Site, marked with the following details:

- Water body;
- TOB;
- Outline of subject property;
- RAA;
- 30 metre long perpendiculars to the TOB, at the midpoint of the Site, and every 40 metres for 200 metres in both directions from the midpoint of the Site; and
- Table showing measurements from TOB to the first permanent structure encountered along the 30 metre long perpendiculars.

The orthophoto included in this RAR Report contained the necessary details, with the exception of the 30 metre wide RAA, but was at too small a scale to effectively show the TOB (or HWM as was used in the original version of the Report).

No other errors or omissions were noted in this section of the Report.

Section 3 (Site Plan) was generally well done as submitted with the original version of this RAR Report. The scale was large enough to show the necessary details, although the inclusion of a scale bar would be a useful addition for those times that the Site Plan is printed or viewed at a different size than it was created at. The presence of the Riparian Assessment Area was nice to see, as this is component is almost always missing from RAR Report Site Plans. The Site Plan included in the revised Report did require an amendment to reflect the realignment of the SPEA with the TOB instead of the HWM.

4.2.2.3 Measures, Monitoring & Plans for Post-Development Reporting

Measures are not a required component of Assessment Reports completed using the Simple Assessment methodology. For this Report the QEP was either unaware that measures were not required or simply elected to include them anyway.

In Section 5 the QEP outlines monitoring activities that are to take place before, during and immediately after the development activities. In this RAR Report the QEP included the key components of an appropriate monitoring plan:

- Surveying, flagging and fencing of the SPEA prior to construction activities;
- Ensuring that the sediment and erosion works are in place before construction begins;
- Full-time environmental monitoring during the initial excavation work and then bi-weekly inspections until the development is completed; and

- Periodic checks of the SPEA boundary to ensure that encroachment on the SPEA is not occurring.

The QEP also acknowledges that a post-development report is required at the completion of the project.

4.2.3 Conclusion

The QEP incorrectly signed opinion (7a) in Section 7 of the Assessment Report. This is the opinion to sign when the developer/QEP is requesting a modification of the calculated SPEA. In this case the SPEA as determined using the Assessment Methods was going to be respected by the altered development proposal and opinion (7b) should have been signed.

Modifications to the SPEA require that the developer/QEP obtain permission from the local government and DFO in the form of a Letter of Flex and Letter of Advise respectively. In cases where the QEP correctly signs opinion (7a), these two letters would be appended to the RAR Report.

4.3 Case Study Three

4.3.1 Background

Case Study Three is a review of a RAR Report that was originally submitted to MoE Region 1 – Vancouver Island on October 29, 2006 as a Simple Assessment. Comments from a DFO reviewer were sent to the authoring QEP on or shortly after November 8, 2006 and from a MoE reviewer on or shortly after November 14, 2006. A revised RAR Report, now done using the Detailed Assessment Methods, was submitted on November 20, 2006. The file does not contain a record of reviewer comments for this second edition of the RAR Report, but the authoring QEP submitted a third version of the Report on November 27, 2006. The third version of this RAR Report met reporting criteria.

The various versions of this RAR Report can be used to highlight many of the deficiencies that are found in RAR Reports submitted to the RAR notification system. The original RAR Report, completed using the Simple Assessment Methods, highlights the challenges a QEP faces when deviating from default values for fish presence and stream permanence. The second submission was primarily done using the Detailed Assessment Methods, but still contained elements of a Simple Assessment. The figures in all three versions of this RAR Report are poorly designed and lacking many of the essential components.

This RAR Report was submitted in support of an application for construction of a single family residence on a 2.01 hectare lot in rural Metchosin on Vancouver Island. The Site contains a small step-pool stream that drains directly into Matheson Lake. Matheson Lake supports populations of cutthroat and rainbow trout, coho salmon, threespine stickleback and prickly sculpin. Riparian vegetation in the vicinity of the Site is well developed and includes conifers, Arbutus, herbaceous shrubs, ferns and mosses.

4.3.2 Assessment Report

As initially submitted, the Report was incomplete and reflected most of the top ten errors so far encountered in RAR reports. The report was returned to the QEP within 16 days of submission, along with a checklist of deficiencies resulting from reviews by both DFO and MoE staff. It was amended by the QEP and re-submitted approximately 12 days later. The second submission was completed using the Detailed Assessment methodology, but was returned to the QEP likely due to errors and omissions in the Site Plan. Seven days later, the QEP submitted a third version of the Report, which this time contained a corrected Site Plan showing ZOS for LWD, Litter Fall & Insect Drop, and Shade. Despite the necessity of two major revisions, the RAR Report was deemed to have met RAR reporting criteria within about six weeks of its first submission.

4.3.2.1 Tombstone Data

In the initial submission there was both missing and incorrect information. No parcel identifier (PID) was given for the property. The PID can be obtained from assessment rolls, certificate of title or land tax notice. The property owner/developer should possess at least one of these documents. The land area taken up by the proposed development was missing, and the stream name and watershed code fields were incomplete. While not all watercourses have a watershed code, the Assessment Methods provide a process for identifying the stream. The QEP is instructed to select the parent stream/river and include the UTM, of the stream under assessment, from the most downstream location with the subject lot. Watershed codes can be found using Land Information BC's Fisheries Inventory Maps⁵ or the Fish Wizard⁶ interactive mapping Website.

4.3.2.2 Assessment Data

In the original submission, the stream was identified as non-permanent and non-fish bearing but the response from review agencies stated that neither conclusion was properly supported. The QEP did identify the stream as dry on the mid-September field inspection, having a gradient of between 17 and 20%, and containing numerous impassable barriers below the Site. It may be unreasonable to call for more proof, however, the QEP can not verify that the stream does not flow for more than 6 months on the basis of a single site visit. Strictly speaking, more proof should have been provided.

In the Report, as originally submitted, the Existing and Potential Streamside Vegetation category (EPSV) was listed as treed (TR), a designation that is reserved for describing Site Potential Vegetation Type when using the Detailed Assessment Methods. If the Simple Assessment method was applied in this relatively undeveloped area it would most likely result in an EPSV category 1. The resulting SPEA would likely be 30m, unless the proof of non-permanence was provided, in which case the SPEA would be between 15 and 30 metres, depending on the location of existing structures. This would have ruled out the proposed house construction 14.5 m from the stream. The QEP incorrectly determined the SPEA to be 15m, but then requests forgiveness of 0.5m to allow the footprint of the new structure to project within 14.5 metres of the TOB. According to the QEP, it would cause undue hardship to the developer to require a full 15 metre SPEA. Reviewers from both DFO and MoE felt this request should be supported by a letter from

⁵ http://srmwww.gov.bc.ca/fish/watershed_atlas_maps/maps/index.html

⁶ <http://www.fishwizard.com/>

local government confirming the case of undue hardship, and a letter from DFO supporting the variance. Neither letter is provided.

The Simple Assessment methods require that the RAR Report contain an orthophoto with eleven 30 metre long transects drawn at 40 metre intervals. Measurements made along these transects, from the stream TOB to the first permanent structure, are used to calculate the EPSV category. The Methods specify that the orthophoto be at a scale of no less than 1 to 3000. This scale should allow the QEP to determine the locations of TOB and permanent structures using the orthophoto. The orthophoto must be marked up to show the 30 m x 400 m Riparian Assessment Area and contain a table showing the calculation of the EPSV category. The orthophoto must also have a legend, north arrow and scale. Two versions of the same orthophoto, at different scales were submitted. The scale (not indicated) was too small on both versions to show the details necessary for the calculation of the Vegetation Category. Neither orthophoto showed the RAA, a north arrow or table of transect measurements.

The Site Plan included in this section of the RAR Report was inadequate to determine how the SPEA would be laid out.

In the second version of the RAR Report, the QEP elected to complete the Assessment using the Detailed Assessment methods. There was no new information supporting the conclusion that the stream was non fish-bearing and non permanent, but this was now not required since the Detailed Assessment methodology does not use this information in the calculation of the SPEA unless a ditch is involved. The QEP appears to have correctly determined the average width and average gradient of the stream, and correctly identified the SPVT as "TR" (treed). Using the detailed method, the QEP determined the most sensitive ZOS as Litter Fall & Insect Drop, at 10 metres. The LWD ZOS for the step-pool channel type was correctly established as 1x average channel width, or 2.4m. The Shade ZOS was for a maximum of 7.2 metres, less than the 10 metre ZOS for Litter Fall & Insect Drop. The SPEA must follow the most sensitive ZOS boundary, and therefore the SPEA for this assessment was correctly identified as 10 metres.

Figures included with the second submission are the original orthophoto and a Site Plan showing the 30 metre transects. Absent from any of the figures are the ZOSs or the SPEA. The orthophotos and site plan appear to have been submitted as if following the Simple Assessment methodology even though the body of the Report was structured using the Detailed Assessment methodology.

The third submission repeated the information required for a Detailed Assessment as indicated above. The same two orthophotos appear in the third submission. They were both still missing direction arrows and scale bars. The Site Plan contains most of the necessary information, however it is at too small a scale to be able to distinguish the HWM. The Site Plan appears to be based on a 1:1000 scale drawing, but the plan itself has been reduced and copied to a box within a letter sized page, appearing to be at a scale of more than 1:2000.

In the final submission, there are two photographs that show the stream channel and support the proposition that there are fish barriers. The photographs also show the steep gradient and step-pool nature of the channel. Water was flowing in the channel during the November site visit when these photographs were taken, whereas the channel was dry in September when the initial Site visit was completed. Inclusion of a few extra images, showing a side view of the slope, would have been useful.

4.3.2.3 Measures, Monitoring & Plans for Post-Development Reporting

Measures were only developed and submitted with the second and third version, as they are only a required component for RAR Reports filed using the Detailed Assessment methods. All measures are addressed, but specific actions are suggested for only some. Where measures are not recommended, a brief rationale is given. For example, for Danger Trees, the QEP states that there are no dead trees, snags or 'leaners' within the development area. The QEP uses the Measures to supplement the description of the Site and development plan. For example, under Slope Stability, we learn that the house will be built on bed rock, and that in order to accommodate it blasting will be involved. This information is relevant to the whole assessment, and should be mentioned in the description of the project.

Some Measures do not include important, relevant information. For example, the Tree Protection Measure does not mention trees in the SPEA. Instead, the statement is made that the only clearing performed will be in areas to facilitate house construction. From this, it is not clear that there must not be any tree removal in the SPEA. In fact, it suggests that trees anywhere on the site would be removed if required in order to facilitate house construction. The language in the Measures section needs to be precise and firm, such as "No trees will be removed from the SPEA". This clear assertion protects both the QEP and the client.

The Report includes recommendations for preventing encroachment into the SPEA, as well as for stormwater management. These recommendations are straightforward common sense, and in this case probably did not require a secondary QEP opinion. However, the QEP goes on to predict no erosion from the access road, no slope stability issues, and no floodplain concerns that require measures.

When a QEP chooses not to bring in a secondary QEP to deal with certain measures, he or she may be accepting the liability for anything that goes wrong. The purpose of measures is to protect the features, functions and conditions within the SPEA. The Assessment Methodology contains a table that outlines the expected skill sets that QEPs should have before they can make a recommendation on a specific measure. If a QEP does not comply with the specified skill set, he or she runs the risk of making a mistake that could result in a harmful alteration, disruption or destruction (HADD) of features, functions and conditions necessary to support fish life processes. This in turn could result in costly delays for the developer while activities at the Site are assessed by applicable regulatory agencies and result in the developer taking legal action against the QEP due to faulty advice. The key decision point as to whether a QEP brings in a secondary QEP to look at slope stability of danger trees, etc, is whether or not they are prepared to take on the liability of not doing so.

Cost is an additional factor that may be involved in the decision to bring in secondary QEPs. Under circumstances where the developer is the lot owner who wants to build a house for themselves, and faces major development costs, there may be a hesitation on the part of the principal QEP to bring in another QEP at additional cost to the client. But it needs to be clear that there can be short and long term costs to the property owner. The services of a secondary QEP may cost less than repairing the damage that results if a HADD occurs. Also, there is a liability on the QEP for making statements about measure that are beyond his or her experience.

In this case, recommendations are made for measures concerning stormwater and encroachment. However, the QEP does not recommend monitoring during development. Instead, the QEP will

be available on-call in the event an issue arises. Unfortunately, by the time an issue arises, it may already be too late to prevent a HADD. Again, this recommendation may be risky for the landowner and create a liability for the QEP. It would be better in this circumstance to state that the site would be visited once or twice by the QEP during development, to ensure compliance with the measures.

The third version of the RAR Report does indicate that a post-construction report must be filed by the QEP.

In the original submission, the QEP signed Box 7a incorrectly. This box is to be signed in the event of a Letter of Flex from a local government or a Letter of Advice from DFO has been obtained and is attached to the Report as an appendix. Under these circumstances, Box 7a is reserved for reports in which encroachment into the SPEA is called for. If so, it would be expected that the letters of authorization would also be attached to the report. This error was pointed out to the QEP, and the correct professional opinion (7b) was checked in the two subsequent submissions.

4.3.3 Conclusion

In this case, the QEP first filed the Report using the Simple Assessment methodology and calling for a 0.5 metre encroachment into a 15 metre SPEA. Letters supporting the encroachment were not supplied. The second and final versions of the Report were completed using the Detailed Assessment methodology. Switching methodologies reduce the SPEA to 10 metres, solving the problem of wanting (needing?) to build the house 14.5m from the TOB. The MoE and DFO provided very clear commentary back to the QEP after the initial submission, giving guidance on deficiencies and correction that were needed. The turn-around times seemed very reasonable.

In this case, a more forgiving (narrower) SPEA was achieved by the QEP for the developer as a result of switching from the Simple to the Detailed Assessment methodology. As QEPs continue to develop their practice of the RAR, we may find that the detailed method is generally preferred for this reason. However, with the adoption of the Detailed Assessment methodology comes the requirement of developing and recommending Measures for the protection of the SPEA. This can significantly increase the cost of an Assessment Report, especially where site complexity requires the services of additional QEPs. It seems at this point that the primary QEP is often willing to forego the extra expense of additional QEPs and take on the liability for all components of the Measures Section of an Assessment Report. The short-term savings to the client may be offset in the long term by the results of damages caused by slope failures, soil erosion, blowdown or other issues triggering charges under the Fisheries Act or provincial statutes.

4.4 Case Study Four

4.4.1 Background

The RAR Report reviewed for Case Study Four was originally submitted to MoE Region 1 – Vancouver Island on April 28, 2006. The RAR Report was returned to the QEP to correct an error in the layout of the SPEA (incorrectly measured from the ‘natural boundary’). The second version, submitted on May 29, 2006 was deemed to have satisfied the RAR reporting criteria. A letter of complaint submitted on October 30, 2006, followed by inspections from representatives

of local government, MoE and DFO, resulted in the Report being returned to the QEP on November 17, 2006 for further revision. A third version was submitted on December 14, 2006.

This RAR Report is interesting because as originally submitted to the RAR notification system it was substantially complete and may have been accepted with only minor revisions had it not been for the letter of complaint received by the MoE. The letter of complaint identified numerous concerns and inconsistencies in the Report. The subsequent investigation by staff from the above noted agencies confirmed many of the errors and inconsistencies identified by the author of the letter of complaint. The review of this RAR Report also brings up the question of how a QEP should proceed when they arrive on a Site that has recently been subject to extensive clearing of vegetation and soils in the Riparian Area.

This RAR Report was submitted in support of a riparian set-back for the construction of a single family residence on a 0.18 hectare lot on Cowichan Lake in Youbou, BC. Cowichan Lake has a high fisheries resource value and provides significant habitat for several salmonid and non-salmonid fish species. At the time of the Assessment, very little riparian vegetation was present on the Site. The condition of the riparian vegetation on waterfront parcels adjacent to the Site ranged from fully intact to sparse.

4.4.2 Assessment Report

The first version of this RAR Report satisfied the reporting requirement in all areas except for the layout of the SPEA. The Tombstone Data, Fisheries Resource Values, Assessment Data, Measures, and Monitoring sections were all completed correctly. The QEP incorrectly used a natural boundary as the lower limit for laying out the SPEA at the Site. Many legal surveys conducted for lots containing a waterbody have a 'natural boundary' identified on them. This natural boundary rarely corresponds to the HWM of the waterbody, and it should not be used for the purposes of conducting a RAR Assessment. For a lake, the HWM can be determined in one of two ways:

- If regulated or gauged, the lake level as agreed to by the controlling or measuring agency can be used as the high water level; or
- If un-regulated and un-gauged, the HWM is where the presence and action of annual flood waters are so common and usual as to mark the soil and vegetation with a distinct boundary between lake bed and bank.

In the second version, submitted approximately one month after the original submission, the QEP had amended the Site Plan to show a HWM distinct from the natural boundary. The QEP indicated that this HWM was confirmed in the field. The Site Plan from the second version was still missing individual ZOS and the RAA, but this was not likely sufficient to prevent the RAR Report from meeting the reporting criteria.

On October 30, 2006 a letter of complaint submitted was submitted to the RAR notification system. The areas of concern identified in the letter of complaint included:

- RAR Assessment failed to acknowledge damage done to the riparian zone in the months preceding the Assessment;
- lack of field evidence to support that the house pad is outside of the 15m SPEA;
- no acknowledgement of evidence of vegetation removal or damage;

- confusion of definitions for “Natural Boundary” and “High Water Mark”;
- slope stability issues not addressed; and
- no acknowledgement of a covenant (limiting tree removal) included on the property title.

The Report was returned to the QEP on November 27, 2006 with the letter of complaint, and a report on a site inspection performed by representatives from the Cowichan Valley Regional District (CVRD), the MoE and the DFO. The QEP was requested to amend the RAR Report. The requested amendments were made by the QEP and the Report was resubmitted on December 14, 2006. It is not known at this time whether the amended Report met the RAR reporting criteria.

4.4.2.1 Tombstone Data

The tombstone data section was complete. No secondary QEP was included. The absence of secondary QEP information was surprising given the apparent complexity of the Site: steep slopes; cut-banks from road and building-pad excavations; and recent removal of much of the Sites vegetation. Secondary QEP information is required when there is a secondary QEP. Secondary QEPs need to be retained if the completion of any the Measures requires expertise outside that possessed by the primary QEP. Measures commonly necessitating a secondary QEP include Slope Stability, Stormwater Management and Windthrow.

4.4.2.2 Assessment Data

The Fisheries Resource Values (Section 1) area of the original Report was adequate. It contained a list of salmonid species present in the lake, but does not mention that the lake also contains many non-salmonid species. There are brief descriptions of both near-shore fish habitat and the quality of riparian vegetation. The description of existing riparian failed to mention that significant clearing of riparian vegetation had recently occurred at the Site.

Section 2 of the report contains the Riparian Assessment. The SPEA was calculated to be 15 metres wide, which is correct. The Shade Zone of Sensitivity (ZOS) for the Site would not be 15 metres as indicated, it would be zero. The Shade ZOS is correctly determined by dragging (in computer drafting space) the HWM line of the lake due south a distance determined by consulting Table 3-5 in the Assessment Methods⁷. Since the subject property is on the north shore of Cowichan Lake, the resulting ZOS for Shade is zero.

The description of the HWM is problematic. The QEP indicates that the HWM identified on a legal survey was confirmed on Site using vegetation characteristics. It is obvious from photographs of the Site that most vegetation and even organic soils have been recently removed from the Site as far down as the edge of the gravel beach. On a lake, the HWM should be determined by using either, recent published records of gauged water levels, or evidence of wave action on soils and vegetation, deposition or scouring of fines, or the deposition of rafted materials. Regarding the legal survey, it is not made clear: when the legal survey was completed;

⁷ BC Ministry of Environment. 2006. Assessment Methods – Schedule to BC Riparian Areas Regulation (B.C. Reg. 376/2004, revised May 2006). Province of British Columbia, Victoria, BC.

for what purposes the HWM was determined; or how the HWM was established. The original Assessment Section was unchanged in the final report.

The Site Plan (Section 3) included with the original submission was incomplete. The Site Plan did not include the RAA or individual ZOS. The Site Plan does show most of the elements of the proposed development. Missing from the plan are the proposed location of the dock and waterfront access trail. As discussed above, there is a lack of evidence confirming that the HWM as indicated on the Site Plan reflects its true location at the Site. These shortcomings of the Site Plan were not addressed in the final submission of the RAR Report.

4.4.2.3 Measures, Monitoring & Plans for Post-Development Reporting

In the first edition of this RAR Report, the QEP addressed all Measures. For some measures such as Danger Trees and Windthrow, the QEP simply provides a brief rationale for them not being an issue at this Site. Other Measures such as Sediment and Erosion Control and Stormwater received more detailed treatment by the QEP. Some of the descriptions in the Measures, caused this reviewer to question whether or not the primary (and only QEP involved at this point) was qualified to provide professional advise in all of the areas covered by the Measures. For example, under Slope Stability the QEP states “the development of the gravel access road down to the lot through the steep upper slope area has resulted in the excavated embankments showing signs of instability....This slope instability occurs well outside the SPEA and represents no risk to its integrity.” In the Encroachment in the SPEA Measure we learn that the lower portion of this access road might actually be inside the SPEA. This seems like a situation where the primary QEP should have retained a QEP with specialized expertise in geotechnical engineering. The Measure for Sediment and Erosion Control also seemed inadequate, consisting only of water-bars installed across the steep access road, directing sediment laden runoff in vegetated areas above the SPEA. The Stormwater Management Measure was similarly underdeveloped, most of it focused not on storm water, but septic water.

It is important that QEPs possess the necessary qualifications before assuming responsibility for developing recommendations for a particular Measure. It will often be the case, especially for complex sites, that the primary QEP will need to acquire the services of other QEPs with specialized training in such areas as Sediment and Erosion Control, Stormwater Management, Slope Stability or Danger Tree Assessments. An inadequately developed Measure, that allows a HADD to occur, can result in a suit being brought against the QEP that signed off on the RAR Report. It is a critical part of the primary QEP's due diligence that they only provide opinions where they are qualified to do so. The letter of complaint that was filed against this RAR Assessment raised, as one of its points, the issue of whether or not the primary QEP was qualified to provide an opinion on the Slope Stability Measure. This was addressed in the third version of the RAR Report, which included a Slope Stability Assessment by a secondary appropriately qualified, QEP.

In this case study, the RAR Assessment didn't take place until after the development had been started. Extensive site preparation including construction of an access road, clearing of much of the vegetation in the lower portion of the Site and excavation of a building pad, was completed in the months preceding the completion of the field component of the RAR Assessment. The QEP didn't try to hide these facts, but fails to take them into account when developing Measures for the Site. The QEP downplays the importance of Measures for the Site claiming that “Vegetation cover is minimal in the riparian area...” and “...anthropogenic influence is high...” In other

words, there isn't much to protect, so why make the developer go to great lengths by stipulating complicated measures?

The problem with this scenario is that letting the developer off the hook in terms of strictly adhering to the RAR because he/she has already destroyed most of the riparian vegetation originally present at the Site would set a dangerous precedent. The minimum that the QEP might have done is to give full consideration to conditions of the Site prior to recent development activities when stipulating in the Measures the degree of protection the SPEA was to receive. A better approach could have been to recognize the recent damage done within the RAA and made strong and specific recommendations for vegetative restoration work as a part of the Measures at this Site. As noted by CVRD staff after a visit to the Site in response to the letter of complaint, while there are many instances of lakefront property owners having removed tree and shrub vegetation to expose a gravel beach, an alder/willow complex and other native shrubs would, if allowed, colonize these cleared beaches.

Measures for Preventing Encroachment on the SPEA indicated that the developer had already started site preparations and that the gravel road access may encroach into the SPEA. The QEP recommends that revegetation of the potentially impacted area of the SPEA take place, however, there is no specific vegetative restoration plan provided. The QEP recommends appropriate species for the area, but there are no details as to how many of each species are to be planted or where specific species should go. The QEP simply reports that "replanting of the potentially impacted area would enhance the SPEA", which could be interpreted by the client/developer that revegetation is not really required at all. If the QEP recommends that revegetation or restoration of the SPEA be conducted, a detailed restoration plan should be included with the assessment to provide the client/developer with clear instructions on how to do so. A detailed Riparian Planting Plan was submitted with the third edition of the RAR Report.

Measures to address Sediment and Erosion Control during construction and Stormwater Management are included, but are vague. In cases where the RAA and/or adjacent areas slope steeply towards the waterbody, control of sediment and erosion and management of stormwater are obvious concerns and should be addressed in detail. The subject property contains slopes in excess of 70% on a lake shore where surface water and mobilized sediments are likely to follow the local topography to lakeshore. The understory vegetation is very sparse (cleared to mineral soil in much of the RAA) and would not be sufficient to control erosion of soils within the SPEA. Detailed recommendations need to be provided in the Report. This would serve to protect: the SPEA from impacts; the developer from the inconvenience of stop-work-orders from agencies charged with protecting riparian habitat; and the QEP from liability if faulty advice resulted in development delays.

In Section 5 of the Report the QEP indicates that Environmental Monitoring for the Site will be restricted to a single visit, to take place before construction commences, that will ensure that the SPEA has been surveyed and fenced, and that the water bars on the gravel access road are working effectively to control runoff from that surface. There is no indication in the Report that the Site will be inspected during construction or that a QEP would be available in the event of a concern over a potential HADD.

In the first and second version of the RAR Report submitted, the QEP signed both professional opinions in Section 7, when only '7b' should have been signed. In the final Report, the QEP signed professional opinion '7a' in error. Professional opinion '7a' is signed only when the

developer and QEP are requesting changes to the calculated SPEA. Changes to the SPEA, which include land swaps or works such as access paths through the SPEA to docks require approval from local government and DFO. In cases where approval for changes to the shape of the SPEA or works within the SPEA have been granted, the QEP must attach the letters of approval to the RAR Report when it is filed. There is no indication in the RAR Report that approval for either SPEA shape modifications or works within the SPEA had been sought. The RAR Report did not include a Letter of Flex from local government or Letter of Advice from the DFO, that would indicate such a request had been lodged. It is unclear if the QEP signed in Box 7a due to potential encroachment of the gravel access road into the 15 m SPEA or if the QEP was confused regarding which professional opinion was appropriate in this instance.

4.4.3 Conclusion

The RAR Report reviewed for Case Study Four was substantially complete as initially submitted to the RAR Notification System, but was deficient in terms of the Site Plan (missing RAA, individual ZOS, and SPEA measured from 'natural boundary'), the Measures section (primary QEP not qualified to provide advice on some Measures) and the Professional Opinion section.

In addition to these deficiencies, the development and the RAR Report became the focus of a formal written complaint. In response to the complaint the Site was inspected by representatives from the CVRD, MoE and DFO. These representatives concluded that the Report would require significant changes before it would accurately reflect conditions at the Site and contain protective prescriptions sufficient to maintain the integrity of the SPEA. The focus of the recommended changes was in the areas of a Slope Stability assessment by geotechnical engineers and a Vegetative Restoration Plan for the degraded SPEA.

It is interesting to look at how useful the current revision of the RAR Assessment Methods is at providing guidance to QEPs on these two topics. The Assessment Methods are very clear in outlining who should be providing Slope Stability advice (Appendix 2:QEP Skill Sets) Section 3.7.3: Slope Stability and the types of threats to the SPEA that should be addressed. On the topic of Vegetative Restoration Plans, however, the Assessment Methods are not very helpful. It seems that restoration of degraded SPEAs is a topic that should be addressed more fully in future revisions of the Assessment Methods.

This case study highlights the challenges a QEP faces when asked to conduct a RAR Assessment on a Site that has recently had land clearing activities undertaken in what will ultimately become the SPEA. It is not appropriate for the QEP to make recommendations for SPEA design and measures to protect the SPEA based on the degraded condition of the Riparian Assessment Area.

Additionally, this case study illustrates the need for precise and strongly worded Measures designed by a QEP with the appropriate training and experience. It is not always possible for a professional biologist to make assessments and recommendations for Measures such as Slope Stability, on Sites as complex as the one investigated in this case study.

4.5 Case Study Five

4.5.1 Background

The Riparian Areas Regulation assessment reviewed for Case Study Five was originally submitted to the BC Ministry of Environment, Region 1 – Vancouver Island on June 13, 2006. It was returned to the QEP for revisions and a second version of the Report was submitted on July 12, 2006. The second version of the report was deemed to have met the RAR reporting criteria.

This RAR Report, completed following the Detailed Assessment methods was selected for review because it highlights challenges surrounding the calculation of the Shade ZOS, the determination of HWM for a wetland, and the completion a RAR Report for a Site with two different types of waterbody. The second version of this RAR Report contains an good example of what is required of the Site Plan in Section 3 of all Assessment Reports.

The development proposal was for subdivision (six or less lots - with zoning appropriate for further development into single family residences) of a four hectare lot in the Capital Regional District's Juan de Fuca Electoral Area. The Site is approximately six kilometres west of Sooke on Vancouver Island. The unsubdivided parcel contains a portion of a wetland and a portion of an un-named channelized stream that drains the wetland. The wetland is dominated by hardhack and willow. The channelized stream, has a small floodplain populated by skunk cabbage, salmon berry and red alder. The channelized stream ultimately flows into King Creek, which is identified in Land Information BC's Fisheries Information Summary System (FISS) as sensitive fish habitat.

4.5.2 Assessment Report

This RAR Report was substantially complete and of generally good quality as first submitted but was returned to the author for three reasons: an error on the tombstone data page; uncertainty regarding the exact location of the wetlands HWM; and, an incorrect determination of the Shade ZOS.

4.5.2.1 Tombstone Data

The tombstone data is that information entered at the beginning of Form 1. Details of the primary qualified environmental practitioner (QEP), secondary QEP(s), the developer, the proposed development and the location of the proposed development are required here.

This section was complete but contained an error. Under part V. (Location of Proposed Development), the report author initially incorrectly identified the Local Government as the District of Sooke. This was corrected in the second edition of the Report to reflect that the parcel in lies in the Capital Regional District's Juan de Fuca electoral area. The developer typically knows what local government his/her parcel of land lies in. The initiation of an Assessment to satisfy the requirements of the Riparian Areas Regulation usually comes at the request of local government when a development application is submitted. The QEP can verify this information using interactive mapping systems available on many local government websites⁸ or by

⁸ For example Cowichan District Municipality at <http://www.cvrld.bc.ca/html/NewDSPage/maps.html> or Capital Regional District at <http://www.crd.bc.ca/es/natatlas/>

consulting the planning departments of the local government offices that the QEP suspects the Site may fall within.

It is important to make sure that the tombstone data area of the RAR Report is completely filled out and contains accurate information. Errors and/or omissions in section of the Report can result in the developer experiencing needless delays in the approval of their development application. The 'Electronic Submission' area of the Assessment Methods (page 57 and Assessment Report Guidelines available on MoE RAR Website⁹) provides guidance for the completion of this area of the Report.

In this instance, no other errors or omissions were noted in the tombstone data area of the report.

4.5.2.2 Assessment Data

Section 1 of the Assessment Report is a Description of the Fisheries Resource Values. This section should include a summary of species present in the waterbody, fish habitats present, and condition of riparian vegetation. The Fisheries Resource Values section in this report was deemed to be adequate, but is too brief to be very useful to the QEP when it comes time to determine the measures that will be necessary to protect the integrity of the SPEA. The statement is limited to a description of: how the wetland and channelized stream are connected; that the channelized stream flows into King Creek; that King Creek is identified sensitive fish habitat; and that it was not determined if there are barriers to fish habitat between King Creek and the waterbodies under assessment. Missing is a description of potential or actual fish habitat in the wetland and stream, and a description of associated riparian vegetation.

The Fisheries Resource Values section would be more useful to the QEP and the regulatory agencies involved if it included: 1) a description of the potential of the wetland and channelized stream to provide fish habitat; and 2) a description of the riparian vegetation neighbouring the two waterbodies under assessment.

Section 2 for this report outlined the results of two separate Detailed Assessments for the wetland and channelized stream. These Detailed Assessments determine the SPEA widths for the two waterbodies. Two separate Detailed Assessments were required in this instance due to the fact that streams are handled differently than lakes and wetlands when calculating the SPEA width. For the stream, the required steps of the Detailed Assessment SPEA calculation are: determine site potential vegetation type; determine the average width between the stream's HWMs; determine the channel slope and type; and calculate the three zones of sensitivity (ZOS). For the wetland only a determination of the SPVT and ZOS are required.

The remainder individual ZOS for both the wetland and stream SPEA calculations were correctly determined with the exception of the ZOS for Shade. The Shade ZOS is correctly determined by dragging (in computer drafting space) the HWM line of the waterbody due south a distance determined by consulting Table 3-5 in the Assessment Methods¹⁰. The QEP incorrectly applied the ZOS for Shade, with the critical effect of under sizing the SPEA for the wetland by between 0

⁹ http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/riparian_areas.html

¹⁰ BC Ministry of Environment. 2006. Assessment Methods – Schedule to BC Riparian Areas Regulation (B.C. Reg. 376/2004, revised May 2006). Province of British Columbia, Victoria, BC.

and ~10 metres. The QEP believed the wetland to be predominantly north-facing, resulting in a negligible ZOS for Shade. In fact the wetland is predominantly south-facing and the Shade ZOS, correctly determined, ranges from approximately 1.5 metres (along a portion of the wetland boundary that runs almost north to south) to approximately 25 metres. This error was corrected in the second version of the RAR Report.

Section 3 contains the Site Plan for the proposed development. The site plan must:

- Be of a suitable size and scale to show necessary details (local government usually stipulates drawing size for plans submitted with development applications);
- Contain a legend, a north arrow, and a scale bar;
- Show the proposed subdivision boundaries or building envelopes;
- Show the waterbody (waterbodies);
- Show the Riparian Assessment Area;
- Show the HWM of the waterbody (waterbodies);
- Show the ZOS for the waterbody (waterbodies); and
- Show the resulting SPEA.

The site plan as initially submitted with this Report was generally well done. The missing or incorrectly drawn features were: the north arrow; the Riparian Assessment Area; the wetland's HWM; and Shade ZOS; and the SPEA. The north arrow was pointing approximately northeast. The Riparian Assessment Area was not identified. The Riparian Assessment Area is a 30 metre strip measured perpendicularly from the HWM of the stream, wetland, or lake.

The HWM for the wetland was labeled on the Site Plan as "approximate". The HWM must be accurately determined in the field, using all available information. If the waterbody in question does not have a regulated level that can be used to survey the HWM, then the QEP must determine the HWM based on physical evidence in the field. Such evidence can include changes in the vegetation, deposition of sediment fines and litter, and/or signs of scouring. For a wetland, the loss of obligate hydrophytes is often the clearest indicator of the HWM. A list of obligate hydrophytes for BC can be found in the BC Ministry of Forests, Land Management Handbook No.52-Wetlands of BC, available on-line¹¹.

The Shade ZOS as shown on the Site Plan was incorrect, due to errors made in its calculation on Section 2 (see discussion above). Due to inaccuracy surrounding the HWM of the wetland and the incorrectly calculated Shade ZOS, the SPEA shown on the Site Plan was also incorrect.

Good features of the original Site Plan include that: it is of an appropriate scale; shows the waterbodies, the three ZOS, and proposed development; and had an informative legend. The Site Plan included in the revised report included corrections for all the above noted errors or omissions with the exception of the Riparian Assessment Area, which was still not shown.

¹¹ <http://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh52.htm>

4.5.2.3 Measures, Monitoring & Plans for Post-Development Reporting

For any given proposal it is possible that not all measures will need to be developed. A level site containing a stream with very gently sloping banks would not require a detailed slope stability assessment. The QEP must provide a rationale for not developing any one or set of measures. It is not acceptable to just omit measures that the QEP feels in her/his professional opinion do not need addressing. When the development is for subdivision, the developer and QEP might not have all the necessary details to provide Measures that will protect the Site through to the end of the construction stage of the project. For developments at the subdivision stage, it is important that the QEP stipulate a level of environmental monitoring that will catch problems that may occur when the construction phase of the development begins.

For the report under consideration, all Measures were identified and the ones identified by the QEP as having an impact on the integrity of the SPEA were developed. The QEP decided that measures did not need to be developed for danger trees, windthrow, slope stability or floodplain concerns. Based on the description of the Site provided in the report, it appears that this judgment by the QEP is reasonable.

For the measures that were developed in the Report (tree protection, encroachment, sediment and erosion control, storm water management), the language contained was sometimes vague and lacking in detail. For instance under Tree Protection in the SPEA during construction, the QEP concluded that "...trees have been retained within the wetland SPEA. These trees should be fenced to prevent further damage." A statement that would better protect both the QEP and the SPEA would clearly specify when and where the fence will be constructed, and by whom, i.e. "before continuing with site preparations or construction, the proponent will ensure that the SPEA is flagged by a BCLA surveyor, fenced with snow fencing on steel posts such that the snow fencing is not less than two times the trunk to dripline distance from the trunk of all trees within the SPEA." At the end of the Assessment Report, the QEP gives their professional opinion that there will be no harmful alteration, disruption, or destruction (HADD) of natural features, functions and conditions that support fish life processes in the riparian assessment area. It is in the best interest of the QEP that they clearly lay out for the developer how best to achieve this goal.

The encroachment measures also need to be more forceful than, "...the SPEA should be clearly marked..." and "The construction of temporary or permanent structures and the construction of trails are to be avoided within the SPEA". It is important to specify clearly what is meant by encroachment. A list of prohibited activities should be included, i.e. vehicle traffic or parking, storage of building material, stockpiling of compost or land-clearing debris, and landscaping.

The measure charged with preventing encroachment on the SPEA included a recommendation for vegetative restoration work within the SPEA. This is a useful addition. The report indicated that some clearing had occurred on the lands now to be protected within the SPEA. The restoration plan prescribes species that would be appropriate based on the ecology of the Site as well as a suggestion that the restoration planting take place in the fall to maximize survival.

In this report the discussion of post-construction reporting is included in the Measures section, which is fine. It is brief, but indicates that the land owner has been informed of the requirement for a post-construction report to be completed by a QEP and that this post-construction report will be assessing the integrity of the SPEA.

Section 5 is intended to outline monitoring activities that are to take place before, during and immediately after the development activities. In this report the QEP highlights components of an appropriate monitoring plan. These components are:

- Clear marking of the SPEA prior to development activities;
- Ensuring that the sediment and erosion control plan has been implemented before development begins;
- Periodic checks of the sediment and erosion control works, especially during periods of heavy rain; and
- Periodic checks of the SPEA boundary to ensure that encroachment on the SPEA is not occurring.

The above components are all good examples of the type of detail needed in a Monitoring Plan. As indicated in the Measures section, it is important that details are clearly established regarding responsibility for ensuring the monitoring takes place, scheduling of the monitoring, and what criteria are to be used to judge whether or not unacceptable impacts to the integrity of the SPEA are occurring.

4.5.3 Conclusion

The last section of the RAR Report is the professional opinion. In this instance the single QEP selected and signed the correct opinion, '7b'. This is the correct opinion since no works were planned for the SPEA and no changes to the shape of the SPEA were requested.

The initial version of the Report was substantially complete, but contained three errors that resulted in it being returned to the QEP for corrections. The revised Report, with corrections to the Tombstone Data, the SPEA determination, and the Site Plan, was deemed to have met all the RAR reporting criteria and was approved approximately one month after the initial submission.

5.0 Closing Comments

The Riparian Areas Regulation has been in force since the spring of 2006. It is apparent after a quick review of over 130 RAR Reports and a detailed review of the five RAR Reports used in the above case studies that those involved in the successful implementation of this new environmental regulation still have some work to do. There has been a general trend towards improved RAR Report quality over the past year, but it is estimated that only approximately 10% of RAR Reports submitted are deemed to have fully met the RAR reporting criteria. It should be noted that the MoE as of January 2007 is still reviewing 100% of RAR Reports submitted the electronic notification systems (the only way to submit RAR Reports). The MoE envisions being able to scale back this review to include a check of only 10% of submitted RAR Reports. There is considerable work to be done by all parties involved before this scaling back of the review mechanism can be considered.

Each group involved in the implementation of the RAR has a role to play in improving the quality of RAR Reports that result from the completion of a Riparian Area Assessment under the RAR. These groups are: the federal Department of Fisheries and Oceans; the BC Ministry of Environment; local governments including municipalities and regional districts; the development community; and the qualified environmental professionals.

There are excellent reasons for ensuring that the RAR is properly implemented. The protection of riparian areas benefits all British Columbians whether they be concerned with the intrinsic value of healthy intact ecosystems, or with the economic benefit provided by such ecosystems (maintenance of clean water, provision of fisheries, etc.). On a more limited scale, all the mistakes that are being made in the implementation of the RAR waste time. They waste the time of the agencies responsible for overseeing the RAR, they waste the time of the developer hoping to proceed with their project, and they waste the time of the QEP who has to submit revision, after revision until the RAR Report meets the reporting criteria.

All the parties can contribute to improving the implementation of the RAR. QEPs need to educate themselves about the required components of a complete RAR Report. There are excellent guidance documents on the MoE Website and there has been training made available in most communities in BC via a Malaspina University-College lead RAR training course. QEPs need to pay particular attention to the following components of the RAR Report that contribute most frequently to RAR Reports being returned for revision:

- Make sure **all** fields in all sections of the RAR Report are completely correctly – if a particular field or section is not applicable, then describe why;
- Ensure that for Reports completed using the Detailed Assessment methods that the Shade ZOS is determined correctly;
- Make sure that HWM is determined correctly – don't use natural boundaries as marked on legal surveys;
- Ensure the orthophoto included for Reports completed using the Simple Assessment method is appropriately scaled (>1:3000) and contains the necessary components (waterbody, lot boundaries, TOB, 30m x 400m RAA with transects, and a table showing calculation of Vegetation Category);
- Make sure Site Plans contain the necessary components – waterbody, RAA, lot boundaries, development boundaries, individual ZOS, SPEA, scale bar, and complete legend);
- Ensure that all Measures are discussed and that the Measures that are developed include precise prescriptions, timelines, and site-specific language.
- Make sure that any QEP signing off on a Measure has the necessary training and experience required to provide a professional opinion regarding threats to the SPEA;
- Ensure that the Monitoring prescribed includes precise prescriptions, timelines and site-specific language; and
- Make sure that the professional opinions in Section 7 are read and understood before one of them is signed.

The MoE needs to continue with efforts such as workshops that are planned for communities throughout the province this spring. The Assessment Methods should be revised to provide more guidance to QEPs in the areas of Site Plans, Post-Development Reporting and especially Vegetation Restoration works within the SPEA. Case Study Four highlighted that there are times when the SPEA has been significantly degraded immediately prior to the completion of a RAR Assessment. Local government needs to make it clear to the development community that vegetation removal constitutes a development activity and that penalties for ignoring this will be forthcoming. The development community must realize that there are benefits to them for

adhering to reasonable environmental regulations such as the RAR and that attempting to use shortcuts will ultimately lead to delays and increased costs of doing business.

Roger's Farm, Saanich

Highlights

- ◆ Stormwater detention, protection of water quality (*DwC page 3-24, 3-27, 3-28*)
- ◆ Wetland restoration (*DwC page 4-14, 4-40*)
- ◆ Erosion and sediment control during construction (*DwC page 3-30*)
- ◆ Spill containment (*DwC page 3-39*)
- ◆ Site monitoring during and after development (*DwC page 3-21*)

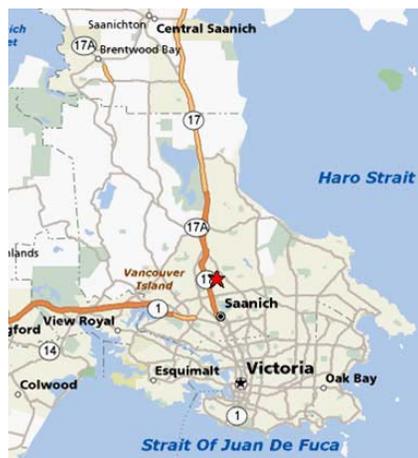


Background

Roger's Farm is single family development on Christmas Hill in the District of Saanich (Figure 1). There are 69 houses, built between 2001 and 2005 by English Developments Ltd. and Fairwest Construction Co. Ltd.

Aqua-Tex Scientific Consulting Ltd. (Patrick Lucey and Cori Barraclough) was hired to help with stormwater management and erosion control for this subdivision.

Figure 1: Location Maps



The site was formerly a family-run farm.

Environmentally Valuable Resources

Gabo Creek runs from the Broadmead area of Saanich, west through Rithet's Bog, under the Pat Bay Highway and across to Glanford Avenue. It then flows through Moor Park before joining the salmon-bearing Colquitz River. At one time, there was a large wetland immediately south of Gabo Creek on the west side of the present-day Pat Bay Highway. During the construction of the Pat Bay Highway many years ago the wetland was used as a fill dump and largely eliminated. The southern end of the former wetland was replaced with a dry detention pond to manage stormwater but it was ineffective.

The subdivision is immediately adjacent to Christmas Hill, which features Garry oak woodlands and terrestrial herbaceous ecosystems.

Municipal Requirements

The District of Saanich required the developer to prepare a stormwater management plan. The requirement for stormwater management would typically have involved excavation of an on-site stormwater detention pond over an area equivalent to three lots. The stormwater would have been conveyed via storm drains directly into Gabo Creek.

Instead, the developer and Aqua-Tex proposed that the Baxter Park wetland be restored and expanded, using the stormwater run-off from the Rogers Farm subdivision and from two older adjacent subdivisions (Figure 4). This option was approved by the municipality, because it provided protection for Gabo Creek and also addressed stormwater runoff from the two additional subdivisions and the Pat Bay Highway (which previously entered the creek directly).

Implementation of Develop with Care Guidelines

Erosion and sediment control during construction

Construction site BMPs prevented downstream sedimentation problems. Steps included:

- ◆ Staging the work to minimize disturbed areas and exposure time;
- ◆ Leaving a 5 m buffer of grass around cleared areas, to act as a filter for small amounts of runoff;
- ◆ Ensuring that piles of dirt were located away from roads, to minimize the amount of sediment that could get washed into storm drains;
- ◆ Covering piles of topsoil with tarps to prevent washing away during rainstorms;
- ◆ Installing straw bale/filter cloth dams in ditches to trap sediment;
- ◆ Installing gravel (3" minus) on temporary road surfaces and parking areas so that dirt was trapped and not tracked on to local roads; and
- ◆ Reseeding disturbed areas as quickly as possible.



Construction site September 2002 (left) and March 2003 (right).
Note the small cleared area and dirt pile located away from the road. Photos Aqua-Tex.

Spill containment

Site equipment was required to use designated areas for refuelling, and all heavy equipment was supplied with spill kits in case of spills or leaks.

Stormwater detention

- ◆ Baxter Pond (wetland) was restored to a functioning ecosystem by excavating a detention area and terracing the banks to provide planting areas. The wetland was planted with cattails, rushes, sedges, willow, red-osier dogwood, snowberry and other native species that would provide habitat for birds and insects and provide a surface area for biofilms¹ to grow. These biofilms clean the water by using the nutrients to photosynthesize. As well, the plants themselves slow the flow of the water and trap sediment. Insects such as dragonflies prey upon mosquito larvae, and other aquatic insects feed on the biofilms and reduce the bacterial load.
- ◆ Stormwater from the Rogers Farm subdivision and two adjacent areas has been directed into Baxter Pond. This wetland filters the water and slows the rate at which water reaches Gabo Creek.
- ◆ Site landscaping uses drought-tolerant species that need minimal watering. This helps to reduce the amount of watering that could contribute to stormwater runoff.



Baxter Pond 2007 (note the sandpile washed in from the Pat Bay Highway, which would otherwise have gone directly into the creek). Photos Judith Cullington (left), Aqua-Tex (right)

Protection of sensitive ecosystems

Part of the original farm included Garry oak ecosystems. The development was designed so that it was built on pasture land and removed as few Garry oak trees as possible. The area with Garry oaks was sold to the municipality, TLC The Land Conservancy and the Provincial Capital Commission at below market value, and added to the Christmas Hill Nature Sanctuary.

¹ A biofilm is a thin layer of slime that develops on surfaces such as rocks in creeks. Biofilm is composed of algae, fungi and bacteria.

Figure 3: Baxter Pond before and after restoration (courtesy Aqua-Tex)



Site monitoring during and after development

Regular monitoring helped to avoid problems. Steps included:

- ◆ Aqua-Tex monitored the site weekly during construction, took photographs using the photopoint monitoring technique, and provided reports to the developer and Saanich staff as needed.
- ◆ Aqua-Tex met with all new on-site crews and met with crews during weekly site checks to monitor the site and provide stormwater education.
- ◆ There was photopoint monitoring of the construction site and wetland for three years to document progress (Figure 3).

Benefits

- ◆ Most of the practices followed were practical, simple and cost-effective, e.g., leaving a vegetated buffer around cleared areas.
- ◆ Wetland restoration has created waterfowl, songbird and aquatic habitat.
- ◆ Stormwater from three subdivisions is being treated prior to entering Gabo Creek. This has minimized flood flows into the creek during heavy rainfalls, and will be reducing the amount of pollutants entering the creek.
- ◆ The wetland is located beside a public trail. The restored wetland is more visually appealing than the former dry detention pond.
- ◆ The District of Saanich had a wetland restored and stormwater treated, simply by agreeing to allow the pond on their land.
- ◆ The developer and the builders from the project have carried these lessons over to many other sites and projects.
- ◆ It is used for education. Local schools take classes to Baxter Pond to explain how the wetland functions.

Lessons learned

- ◆ “If you design systems that work and are practical, developers will do it.” Gordon English, developer.
- ◆ It is important to make sure that all builders and their sub-trades are also made aware of and adhere to the best management practices, especially around sediment and erosion control. There were nine builders involved in construction of these houses.
- ◆ The developer has used, and improved on, many of these techniques in subsequent developments. For example, ‘Aqua-pavers’ are now being used for driveways as they provide a superior means of infiltrating water.

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Figure 4: Aerial View (courtesy Natural Areas Atlas)



Density Transfer, Salt Spring Island

Highlights

- ◆ Density transfer, planning for ecosystem protection (*DwC Section 3.4.2*)
- ◆ Conservation covenants (*DwC Section 4.5.2, Appendix E*)
- ◆ Financial Incentives (*DwC, Section 2.4.2 and Appendix E*)

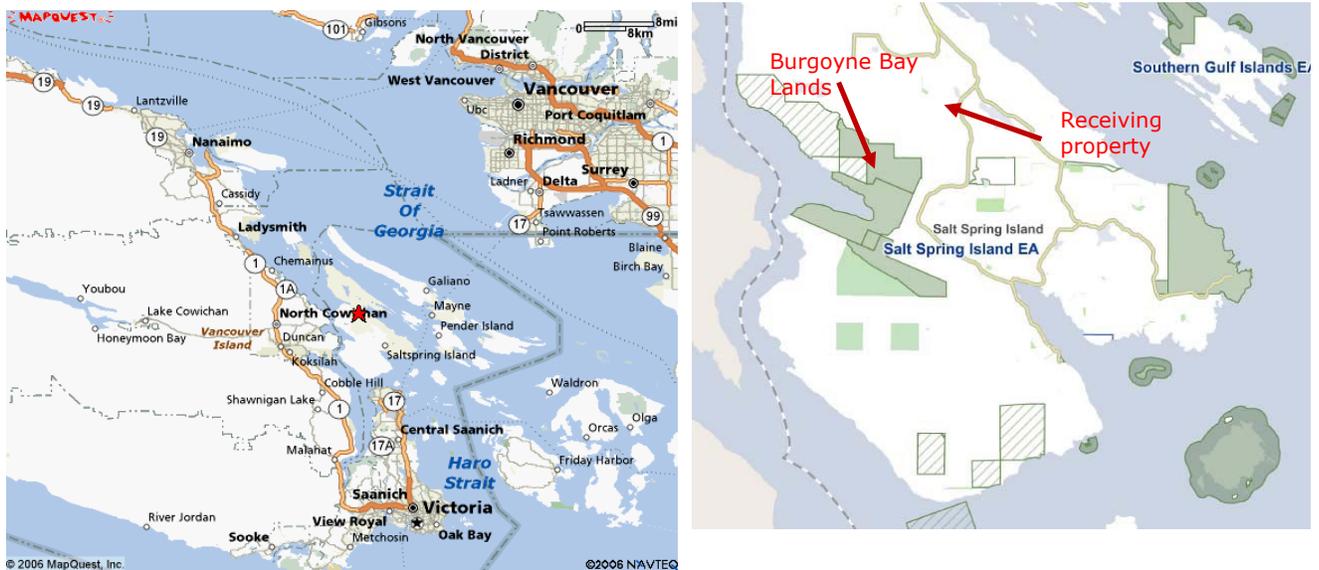
Background

Salt Spring Island is the largest of the Gulf Islands, with a population of almost 10,000 people. It is governed by the Islands Trust. This case study looks at two properties: the 'receiving property' where a landowner was seeking to subdivide her lot, and the 'donor properties' where the landowners (Province of B.C., Capital Regional District and the Nature Trust of B.C.) were seeking to sell the density rights and protect sensitive ecosystems and other natural areas.



Burgoyne Bay. Photo courtesy http://www.flatearthphoto.com/SSI_Burgoyne.htm

Figure 1: Location Map



Environmentally Valuable Resources

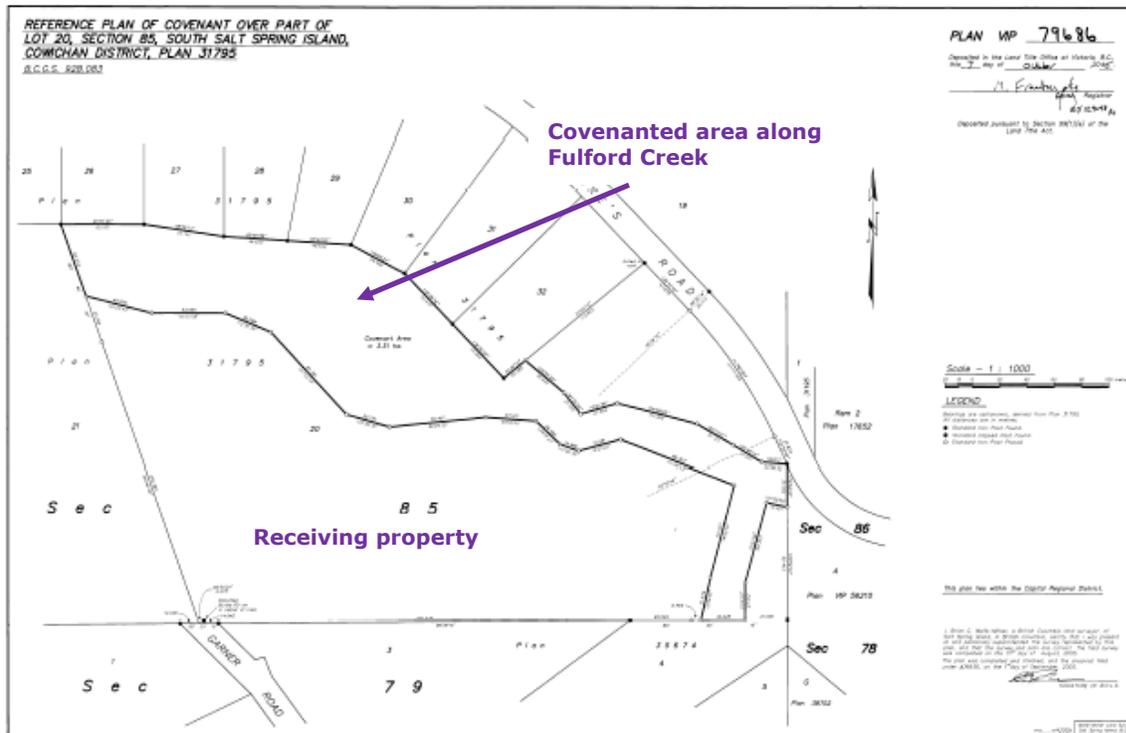
The 'Burgoyne Bay Lands' (the donor property) include eight parcels of land near Mount Maxwell Park. They have been identified as environmentally sensitive areas that include older second growth forest, terrestrial herbaceous ecosystems and riparian areas.

These lands had zoning in place which provided development potential, but were recognized in the OCP as sensitive ecosystems that should be protected from development. The lands were purchased by BC Parks for park use, and they were identified as potential donor

properties for density transfer. This means there is an ability for some of the purchase costs to potentially be recouped retroactively through the negotiation of the development potential in the form of density with interested receiving property owners.

The receiving property includes an undisturbed riparian area along a branch of Fulford Creek, which has been listed as one of the top ten Sensitive Streams in the Province of BC. It is also close to the protected lands around Ford Lake and can serve as a valuable wildlife corridor between these natural areas and Mt. Maxwell Park.¹

Figure 2: Proposed Plan of Subdivision with Covenant Area



Local Government Requirements

Density transfer is a tool provided for in the Salt Spring Island Official Community Plan (OCP). Properties where an increase in density is encouraged are designated as “receiving” properties. These owners may negotiate the purchase of densities from designated “donor” properties, enabling a reduction of density in these donor areas in order to protect water supply watersheds or environmentally sensitive areas. This allows an increase in density on sites where it is consistent with the land use objectives and policies of the OCP, while not increasing the overall density on Salt Spring Island.

Implementation of Develop with Care Guidelines

Density transfer to protect sensitive ecosystems

The receiving landowner wanted to subdivide her property into two parcels. At the time of application in 2004 the site was zoned Rural (R) and accommodated a single family dwelling

¹ Taken from Section 5.0 of Section B of the Baseline Report (Land Titles Office document #EX130358)

and guest cottage. This zoning permitted a subdivision density of one lot per 5 acres (2.02 hectares); however when the property was originally created by subdivision a Restrictive Covenant (held by the Ministry of Transportation) forbade any further subdivision of the parcel.

The landowner applied to purchase the allowable density from the Burgoyne Bay Lands, a designated donor property. The transfer of density was achieved using an amendment to the Land Use Bylaw that created two new spot zonings. On the donor property, the allowable density was reduced from 73 to 72 units, while the receiving property was upzoned to increase the allowable density from one to two units. As part of this application, the owner successfully negotiated the removal of the Restrictive Covenant upon the receipt of the density transfer.

This transfer of density has contributed towards the protection of the Burgoyne Bay Lands by reducing the allowable density. It is hoped that future density transfers will also contribute to this long-term protection.

Conservation covenants

As part of the subdivision and rezoning, there was also protection of sensitive ecosystems on the receiving property.

Fulford Creek runs through the eastern portion of the receiving property, and this area is designated within Development Permit Area 4 (Lakes, Streams and Wetlands). The purpose of DPA4 is for the protection of natural fish and wildlife habitat and the management of drinking water sources. As part of the process, the landowner provided an Ecological Assessment of her property, completed by a biologist from Madrone Environmental Services Ltd. The Salt Spring Island Advisory Planning Commission reviewed this assessment, and undertook an on-site inspection. The requirements of DPA4 were met by placing a Conservation Covenant on these lands.

The receiving property was 11.45 hectares. This has been subdivided to create two residential parcels (5.38 ha and 6.07 ha), and a covenant area (3.31 ha) representing almost 30% of the total area. The covenant area incorporates a minimum 30 m setback from the natural boundary of Fulford Creek (see Figure 2).

The Conservation Covenant is held by the Islands Trust Fund. A local land trust organization is part of the annual monitoring of the protected area. In addition of fulfilling the owner's obligations of the NAPTEP program (see below), the land trust can provide a comprehensive, long term and local perspective of the protected area.

Financial incentives for the protection of environmentally valuable resources

The Islands Trust has implemented a program (the Natural Areas Protection Tax Exemption Program or NAPTEP) that provides tax assessment relief for landowners with a Conservation Covenant on their property. Monitoring of the covenant is an important part of this program. A baseline report is prepared when the agreement is made, and is registered on the property title. The property owner must pay for annual monitoring to ensure that the terms of the covenant are being met.

The landowner applied for, and received, property tax relief under the NAPTEP. For this applicant, the extent of the tax exemption is equal to 65% of the assessed value of the land subject to the protection covenant. The program includes clear direction that no action can be taken that would alter or negatively impact the protected area.

The Natural Areas Tax Exemption Program (NAPTEP) is legislated under the *Islands Trust Act*, and applies to any lands within the Islands Trust Area. Other local governments could apply this tool but would have to initiate a legislative change with the provincial government to do so. The program is in its early stages, but the Island Trust and Islands Trust Fund are monitoring its success and reviewing opportunities for on-going improvements. Their experience will be valuable if other jurisdictions should entertain initiating a legislative change for a similar tool.

Benefits

- ◆ 30% of the receiving property was protected by a monitored Conservation Covenant, including a sensitive water course. The landowner received a property tax reduction in compensation.
- ◆ The density transfer contributed to the environmental protection of the Burgoyne Bay Lands, while maintaining the rural nature of the receiving neighbourhood.

Lessons Learned

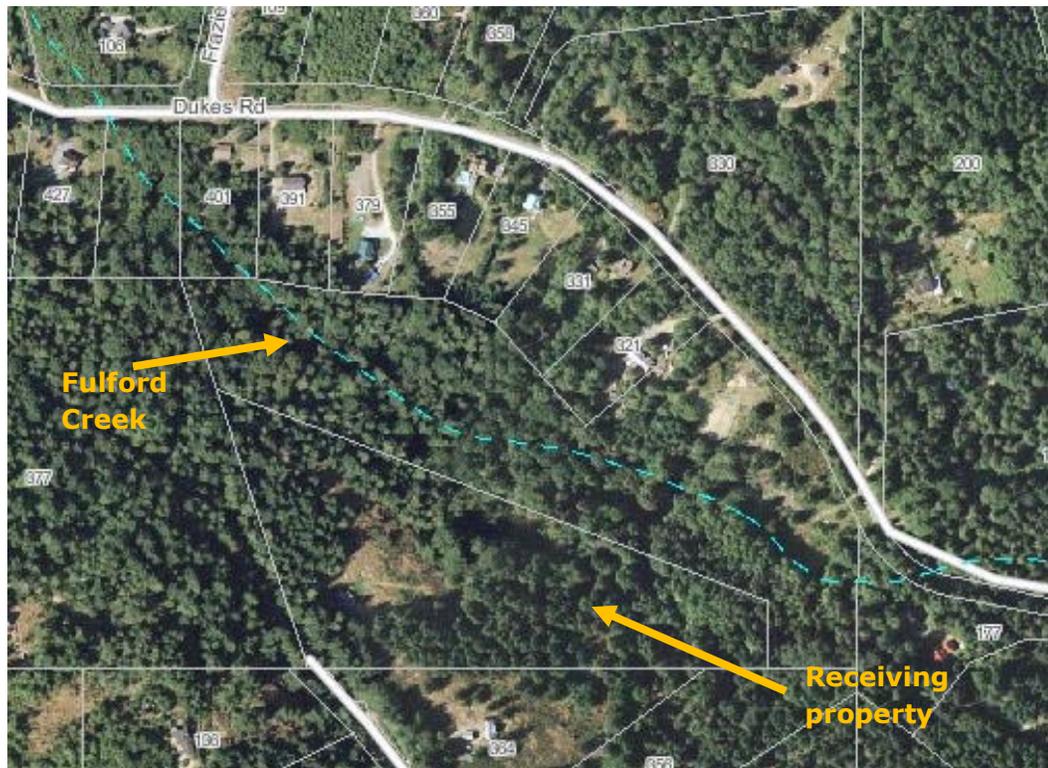
- ◆ The consideration of density transfer applications on Salt Spring Island has been reviewed for transferability to other communities. Currently within the Islands Trust, Gabriola Island has undertaken one, and Mayne Island is considering this program.
- ◆ The proposal was a good initial test of the Natural Areas Protection Tax Exemption Program (NAPTEP), and has helped lead to some improvements to the program (which was re-launched in January 2007). For example, an ecological report will now be required for both the donor and receiving properties.
- ◆ The owner believes more individuals should be encouraged to undertake these processes. This was not a commercial undertaking; the density transfer provided a mechanism to create a housing solution that was in keeping with the community's land use policies. As an aside, the owner has expressed a benefit in gaining more insight into how the Island Trust operates, and an opportunity to engage with committees such as the Advisory Planning Commission and the neighbourhood.
- ◆ Using this specific example, the level of effort on both the applicant and staff's part which was required to create one density was such that consideration of a similar application, including the application to NAPTEP, would be limited. A financial benefit was not the motivation of the applicant. This proposal proceeded because there was a landowner interested in only a slight density increase to fulfill a housing need, and the significant protection of environmental features of the subject land, instead of an increase to the density potential to which policy and bylaw could have supported.

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Trent River Subdivision, Royston¹

Highlights

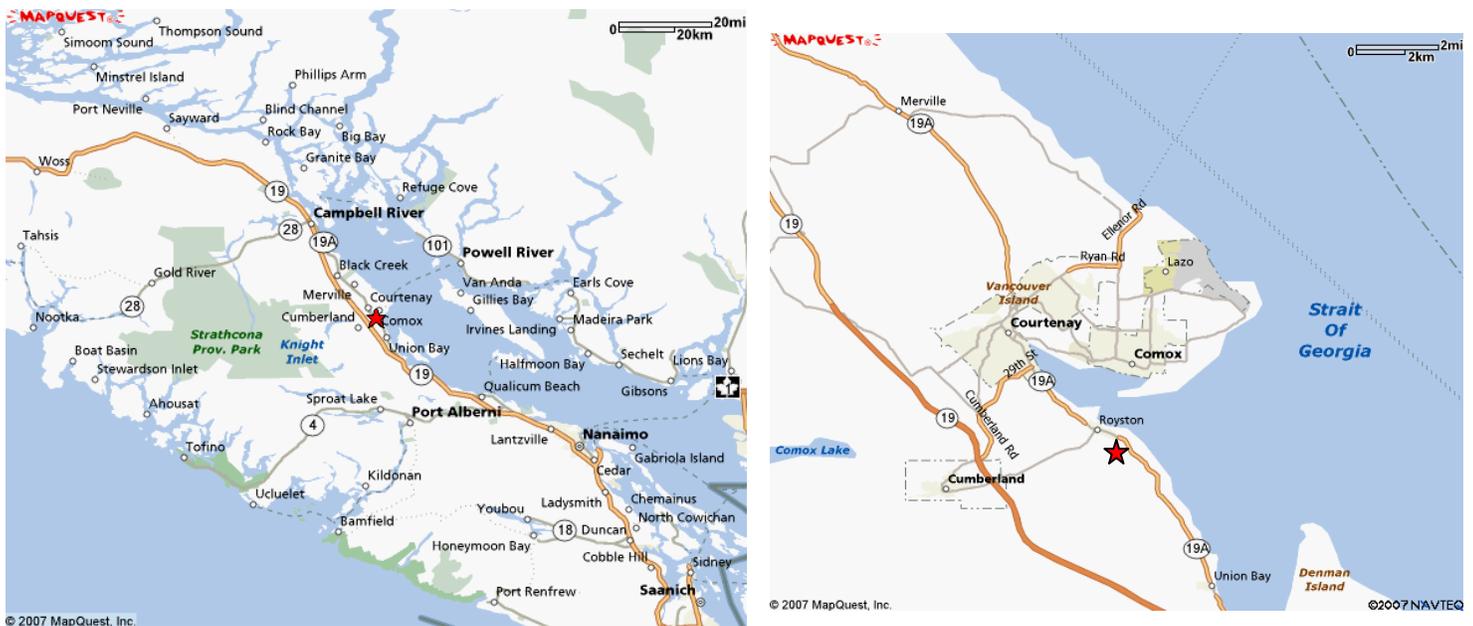
- ◆ Protection of environmentally valuable resources (*DwC Section 4*)
- ◆ Design for conservation (*DwC Section 3.4.2*)
- ◆ Wildlife and Stream Buffers (*DwC Section DwC Section 4.5.2*)
- ◆ Local government inventory and mapping (*DwC Section 2.4.1*)



Location Description and Background

The Trent River subdivision, an initiative of Raven Industries Ltd., lies within the Royston Local Area Plan (LAP) boundaries of Electoral Area "A" of the Regional District of Comox-Strathcona (RDCS). This property is south of the City of Courtenay, on the north side of the Trent River.

Figure 1: Location Map



Environmentally Valuable Resources

The Trent River runs within a deep ravine along the southern boundary of the subject property. The Trent River is designated 'fisheries sensitive habitat' in the Regional District of Comox Strathcona Sensitive Habitat Atlas (2004) and the riparian area has been identified as a 'Riparian Ecosystem' in the Sensitive Ecosystems Inventory. Ecologically sensitive features on the property include a flood plain, a steep ravine and an active Bald Eagle nest tree.

¹ All photos are credited to Rob Milne unless otherwise noted.

Community Development Requirements

The Trent River development site is identified in the Royston LAP as an area where new single family residential development is to be directed. A small portion of the property lying within the floodplain is designated as “Residential Conservation Design”. At the time of application (2004) this area was zoned RU-20 (Rural Twenty), which required a minimum lot size of 20 hectares (49.4 acres). The developer, Raven Forest Products, successfully rezoned the property in 2004 to CR-1, which permitted up to 24 single family residential lots on this 24 acre site (as it is connected to a community water system). The application was supported by the policies of the Royston LAP, but the bylaw amendment process—specifically the public hearing—was positive as the proposal was respectful to the sensitive features of the property.

The Royston Local Area Plan establishes Environmentally Sensitive Area Policies including:

- ◆ The protection of riparian areas along the Trent River;
- ◆ The use of conservation covenants and easements to establish vegetation buffers between built areas and waterways;
- ◆ The protection of eagle and heron nests through the application of covenants and Development Permits; and
- ◆ The use of conservation design principles in new residential areas that shall include measures for the protection of streams and identified wildlife nests. These principles are being used in this context to express an expectation of how a new residential development is designed.

Under the policies for the Residential-Conservation Design Development Permit Area (DPA), the “process to identify areas suitable for residential development” identifies that the permitted density for development will not be affected by the conservation requirements of the DPA. The density can be achieved by clustering the buildings on the potential development area of the site. Environmentally sensitive areas on the site are identified in consultation with the Regional District’s Sensitive Habitat Atlas in addition to other significant features such as excessive slopes, and cultural features of local significance. The remaining land can then be deemed to have development potential and the resulting form of development will have a much higher ecological integrity and a higher proportion of the site conserved as green space. Clustered housing can also benefit the developer through reduced infrastructure costs.

The Local Area Plan also encourages the formalization of proposed trails with landowners, while creating aesthetically pleasing and safe buffers between trails and adjacent land uses.

Implementation of Develop with Care Guidelines

Protection of environmentally valuable resources, buffers

To protect the Trent River floodplain and its significant riparian area, the developer clustered the development in lots located on the upland portion of the property. The property owner presented a proposal that developed 11 lots upland on the north side of the river; eight on the south side of Eagle View Drive and three on the north side (Figures 2 and 3). About 30% of the site, including the hazard lands (floodplain and steep slopes) and environmentally valuable resources (the river and riparian area) were dedicated as park land. Access to the park is provided through a panhandle-shaped lot on Eagle View Drive.

The Ministry of Environment was also involved with the establishment of a 40m buffer protected by Conservation Covenant (held by the RDCS) for the protection for the eagle nest tree (E106-037) (Figure 4). The nest blew down in 2005, but the eagles have since built another nest in another nearby tree that is also within the covenant area.

Figure 2: Trent River subdivision and covenant area

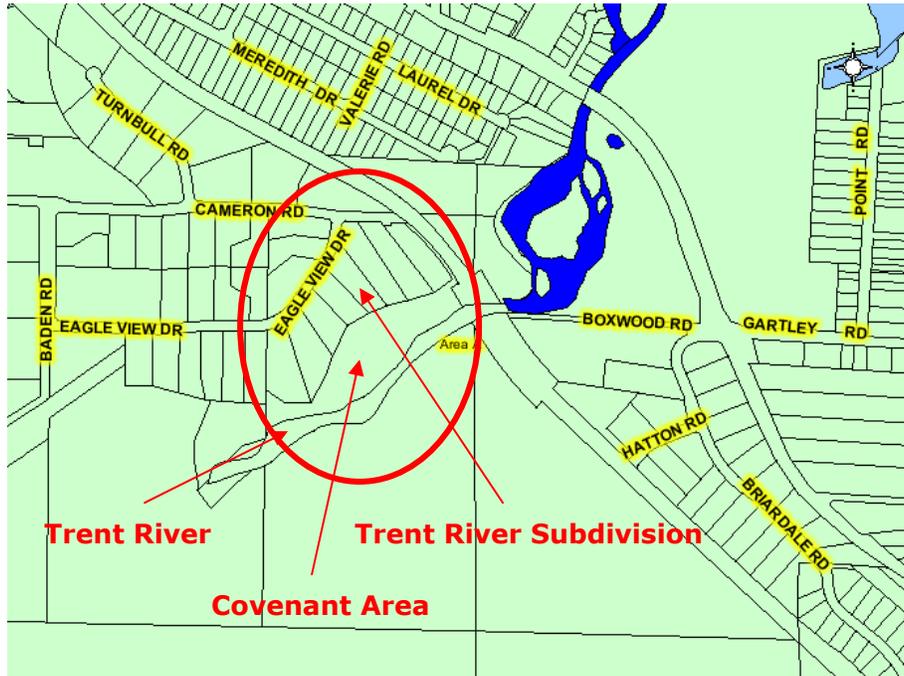


Figure 3: Airphoto of Trent River subdivision and neighbourhood

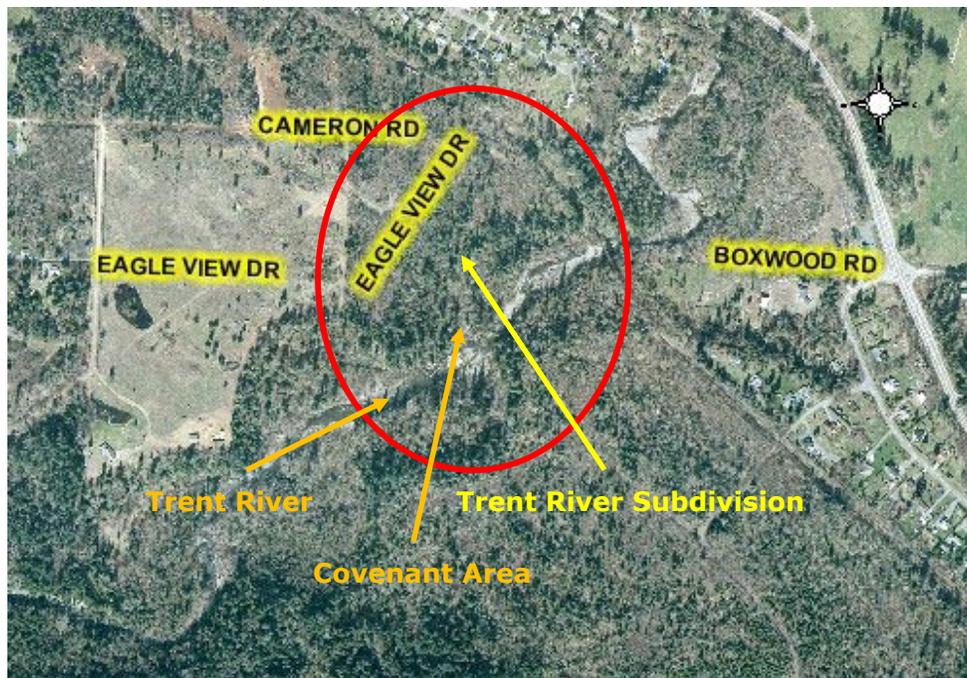
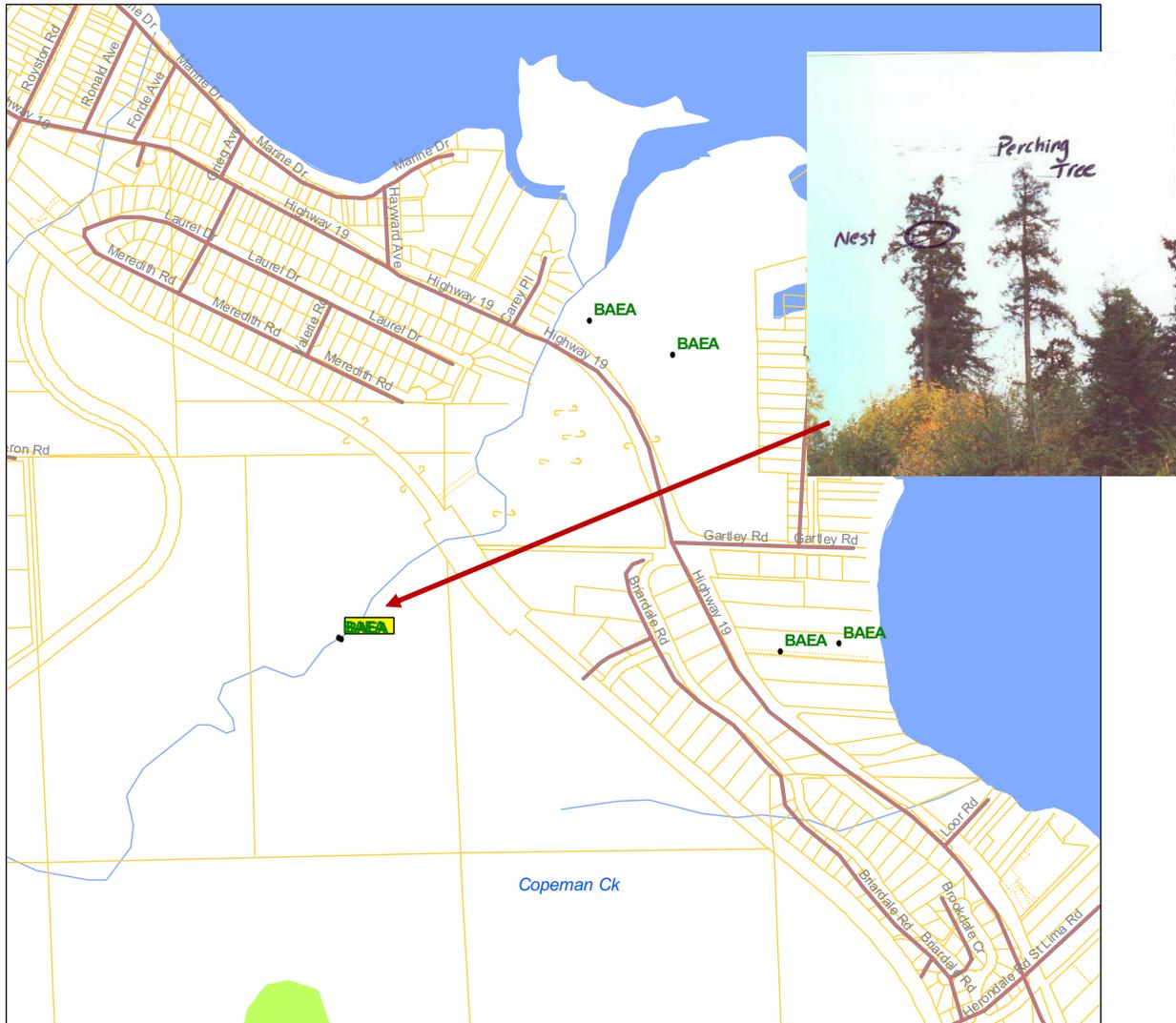


Figure 4: Mapping of Eagle Nest Trees



Ministry of Environment map of eagle nest trees in the Royston area. Photo: Ministry of Environment

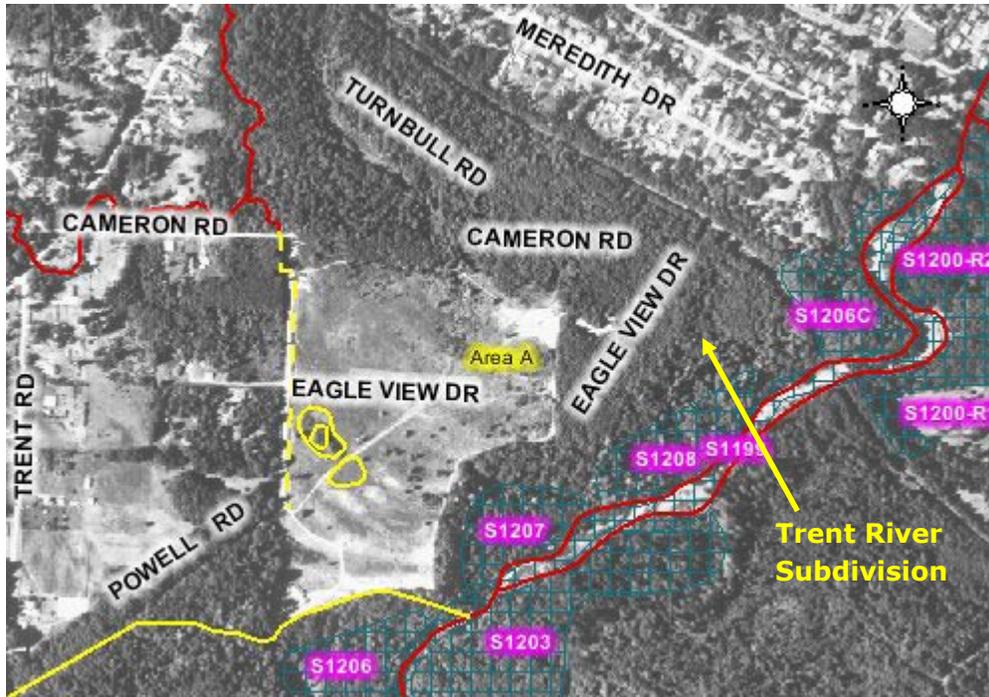
Covenants

A Conservation Covenant held by the RDCS was registered at the time of the subdivision regarding the protection of vegetation, riparian and fisheries values, and geotechnical concerns relating to the steep slope face which runs down to the river bottom. This covenant also grants a right-of-way to the RDCS for annual monitoring and enforcement.

Inventory and Mapping

The Regional District provides on-line access to property information, aerial photos and the Region's Sensitive Habitat Atlas. This makes it easy for developers to find the information required to implement the policy and bylaw requirements for determining the development potential of a property (Figure 5).

Figure 5: Sample of information included in Sensitive Habitat Atlas



From RDCS Sensitive Habitat Atlas, (<http://www.imap.rdcs.bc.ca>). Pink numbers are Sensitive Ecosystems Inventory polygon reference numbers.

Benefits

- ◆ A large buffer was placed around an eagle nest tree.
- ◆ 30% of the site was protected including a significant riparian area.
- ◆ The developer was permitted to increase site density from one to 24 single family homes, in accordance with the Official Community Plan, while still protecting environmentally valuable resources.
- ◆ The rezoning proposal and park dedication are compliant with the Royston LAP policies with respect to lot sizes and the goal of "securing community amenities such as the preservation of sensitive habitats and open space."

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Slope facing down to floodplain, looking to the west, within protected area



Trent River runs along a shale deposit, within the park dedication



Trent River



Trent River from top of bank



Eagle nest tree (photo: Ministry of Environment)

District of Ucluelet Official Community Plan, and the Weyerhaeuser Master Development Agreement¹

Highlights

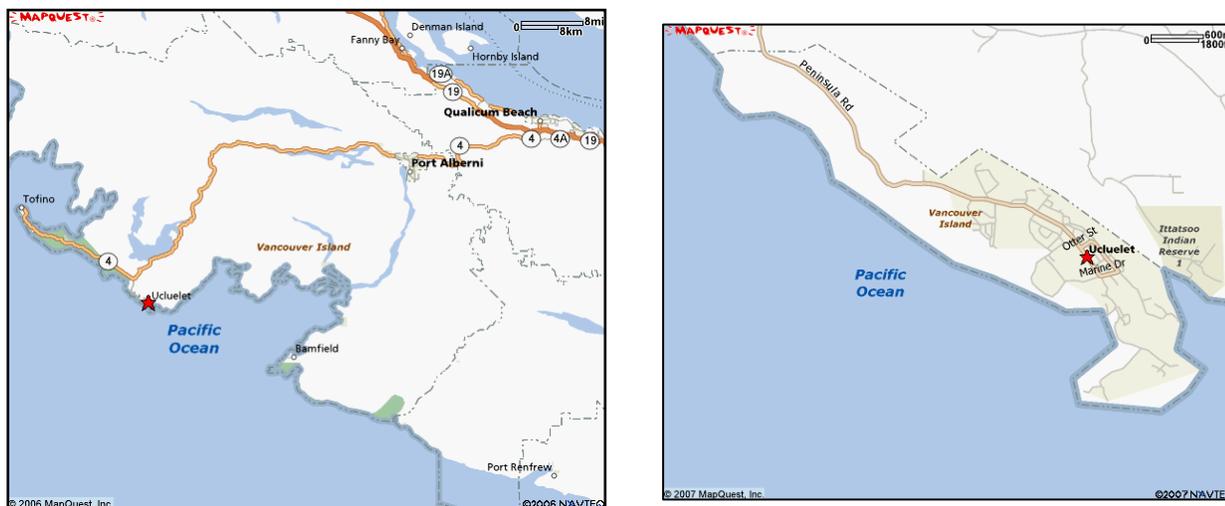
- ◆ Smart Growth (*DwC Section 2.4.4*)
- ◆ Protection of environmentally valuable resources (*DwC Section 2.4.2*)
- ◆ Protection of air and water resources (*DwC Sections 2.6 and 2.7*)
- ◆ Reduction of greenhouse gas emissions (*DwC Section 2.7.2*)
- ◆ Incentives for environmental protection and stewardship (*DwC page 2–18*)



Location Description and Context

The community of Ucluelet is located on the west coast of Vancouver Island, approximately 100 km west of the City of Port Alberni, near the Pacific Rim National Park Reserve (Figure 1). It covers an area of 1,146 hectares, consisting of approximately 670 hectares of land and 478 hectares of water. In 2006, the population was estimated to be about 2,000 people.

Figure 1: Location Map



Background

The District of Ucluelet adopted the core of the existing Official Community Plan (OCP) in 1998. Over a nine month period in 2004, an extensive review of the document was undertaken. This process included significant public process and community involvement, including a Council-appointed Steering Committee.

¹ All photos are credited to Feliche Mazzoni unless otherwise noted

The OCP objectives reflect the community's desire for a more environmentally sensitive approach to the growth of the community:

- ◆ the development of pedestrian and natural linkages;
- ◆ that the land dictate the form of development;
- ◆ a reduction in land clearing for development;
- ◆ the promotion of smaller building footprints;
- ◆ support of the community's on-going efforts to be *Bear Smart*; and
- ◆ 40-60% green space retention (parkland dedication goals).

Community objectives have also led to policy development in the following areas:

- ◆ Density bonusing and the calculation of amenity contributions based on value of parkland dedication;
- ◆ The support of LEED (Leadership in Energy and Environmental Design) practices; and
- ◆ Recycling initiatives.

IMPLEMENTATION OF DEVELOP WITH CARE GUIDELINES – UCLUELET OCP

Smart Growth principles

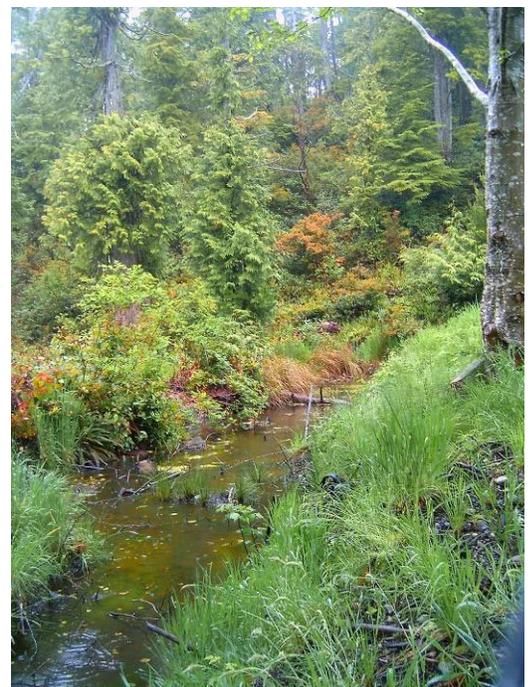
Ucluelet endorses and promotes the following Smart Growth strategies in new development and the redevelopment of existing properties:

- ◆ Undertaking development in a compact fashion – a smaller building footprint
- ◆ Supporting mixed use development
- ◆ Promoting Alternative Development Standards
- ◆ Protecting sensitive environmental areas
- ◆ Reducing (eliminating) detrimental economic, environmental, and social effects of development
- ◆ Promoting multi-modal forms of transportation and pedestrian linkages

Protection of environmentally valuable resources

To achieve the OCP goal to "identify, protect and where possible, enhance environmentally sensitive aquatic and terrestrial natural resources", the Natural Environment Policies include the following.

- ◆ "Identify, protect and enhance environmentally sensitive areas (ESA). These include natural watercourses, marine foreshore areas, and steep rocky terrestrial areas.
- ◆ Require developers to follow the best development practices within the Ministry of Water, Land and Air protection, Land and Parks (BC Environment – Vancouver Island Region) Environmental Objectives, Best Management Practices, and Requirements for Land Development (March 2001 Version).
- ◆ Require environmental impact assessments (EIA) be prepared for subdivisions or development of parcels greater than 2.0 hectares in area for all types of developments and subdivisions.



Riparian Area

- ◆ Identify natural watercourses, including tributaries, and maintain them in a natural state, through designation as Environmentally Sensitive Areas (ESA). Discourage development of floodplains and estuaries.
- ◆ Protect existing green space/open space and foliage by appropriate regulations and guidelines.
- ◆ Encourage tree planting and landscaping in all new subdivisions and developments.
- ◆ Limit or prohibit development within ESA's with guidelines and bylaws to protect the environment.
- ◆ Adopt the principle of minimal impact to the aquatic environment by adhering to the Land Development Guidelines for the Protection of Aquatic Habitat (Ministry of Environment, Lands and Parks) and Water, Land and Air Protection stormwater management guidebook."

In addition, the OCP designates nine Development Permit Areas throughout the community. Each DPA establishes the policies for the development or subdivision of land in a specific area, and incorporates the appropriate guidelines specific to that unique area. As appropriate, these areas are affected by guidelines including the protection of the natural environment, and the requirement for an environmental impact assessment (EIA) to evaluate the impacts of a proposed development on the natural environment.

Protection of air and water resources, stormwater management

OCP policies require that all stormwater discharges should be designed based on Best Management Practices as recommended in the publication titled "Urban Runoff Quality Control Guidelines for B.C." (Ministry of Environment, Lands and Parks).

Ucluelet encourages the use of gravel surfaces for parking areas and pathways, to encourage groundwater infiltration. The municipality has also embarked on several demonstration projects where stormwater is being collected in gravel trenches rather than in pipes. Stormwater management is a critical issue for Ucluelet, which receives about 11 feet of rain per year!



Stormwater management: gravel drainage trench in the new Marine Drive subdivision

To protect air quality and reduce greenhouse gas emissions, OCP policies include:

- ◆ Create a long term plan and location for the disposal of stumps and debris from development sites. (This is an alternative to burning, which results in poor air quality.)
- ◆ Promoting multi-modal transportation options with alternatives to cars, including bicycle- and pedestrian friendly routes.

"Green" buildings

The OCP includes a specific section addressing LEED standards for new developments and re-developments. LEED is an option rather than a requirement, but there are several incentives to encourage its use (see below). The OCP includes information for developers on making their buildings water- and energy-efficient, with good indoor air quality and using re-used or recycled building materials.

Incentives for environmental protection and stewardship

Ucluelet is developing several “green design” options or incentives for developers. Land use policies include:

- ◆ Create a 5% density bonusing category for the use of LEED design guidelines for new construction or renovation as approved by the municipality or under the accreditation of LEED international;
- ◆ Create development incentives for developers to utilize LEED standards as monitored by the municipality.
- ◆ Introduce the LEED density bonusing under the Comprehensive Development Area guidelines.

In DPAs such as the Weyerhaeuser Lands, density bonusing can be tied to the extent of public open space provided.

THE PLAN IN ACTION: THE WEYERHAEUSER MASTER DEVELOPMENT AGREEMENT (WMDA)

Within Ucluelet, the area known as the Weyerhaeuser Lands (DL 283) is comprised of approximately 325 hectares from Tree Farm License 44, which was transferred to fee simple lands within the District of Ucluelet. It was estimated that these lands could ultimately draw over 3,000 new residents by 2018. This agreement includes 150 hectares of those lands, with approximately 25 hectares (15%) protected as greenspaces (e.g., Wild Pacific Trail, neighbourhood parks, and buffer areas).

From the beginning, the District of Ucluelet has encouraged the employment of sustainable development strategies for the development of these lands. The community has expressed that “sustainable development involves a better integration of the environment and the economy on an on-going basis. It does not imply total preservation or non-development, but requires that decisions made by Council, industry, and individuals consider all biological, social, and economic consequences (the triple bottom line).”²

Community Requirements

Through the OCP process, the community of Ucluelet expressed an expectation that development of this growing but unique community needed to be done differently. The WMDA meets these expectations through:

- ◆ The continuing protection and extension of the Wild Pacific Trail and protection of public access;
- ◆ The use of Alternative Development Standards, effective in controlling stormwater and reducing flooding, while maintaining a rural character to the neighbourhood;
- ◆ The incorporation of green roof designs as well as other LEED criteria including geo-thermal heating and on-site stormwater detention ponds;
- ◆ Riparian protection;
- ◆ The enhancement and protection of greenways and buffers; and
- ◆ The support of identified amenities and density bonusing provisions.

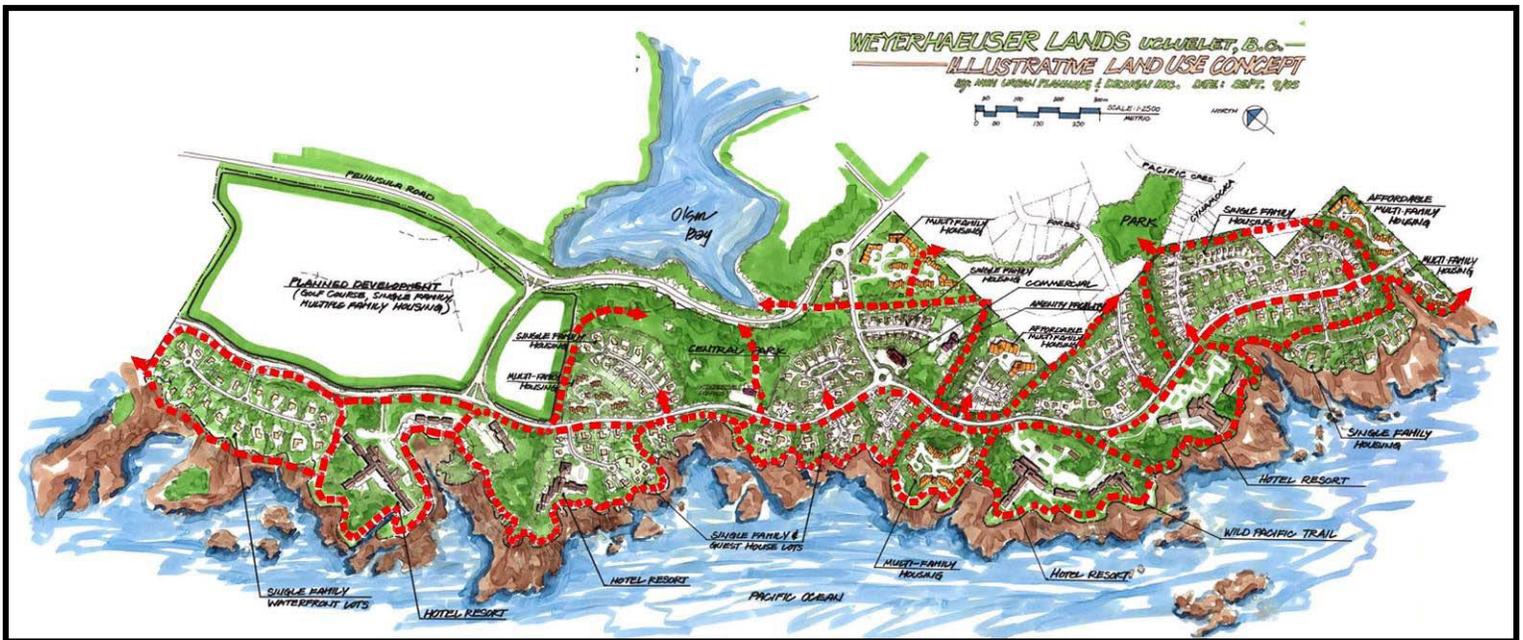
² From “District of Ucluelet: Growth Potential and Development Information” brochure

The specific policies which were developed ensured that the expectations were clearly communicated for everyone, community, property owner, elected officials and developer – which helped to ensure a transparent process.

Figure 2: Illustrative Land Use Concept Plan



Figure 3: Trail Network Plan



The Develop with Care Guidelines

Weyerhaeuser undertook an extensive public process with the community to ensure their plan would execute what the community was expecting. The WMDA has been developed and supported by the community, but not yet applied on the ground. The agreement in place will implement the following *Develop with Care* Guidelines.

Smart Growth principles

The WMDA incorporates Smart Growth principles through the agreement by:

- ◆ providing for smaller building footprints and mixed land uses;
- ◆ incorporating ADS to reduce road widths where appropriate;
- ◆ maximizing soil permeability; and
- ◆ enhancing and extending the Wild Pacific Trail alignment in a 15 m right-of-way.

Inventory and mapping

The MDA is creating an “opportunities and constraints” inventory that includes new and existing environmental and ecological features, archaeological sites, topography, environmental sensitive areas, and wildlife corridors. The inventory provides information that helps to identify and protect natural buffers (stream corridors and riparian areas, topography, and ESAs).

Protection of environmentally valuable resources

THE MDA specifies that issuance of a development permit is subject to the provision of a native vegetation management plan, an environmental impact assessment, and an archaeological assessment (if there are likely to be artifacts or remains on the development property). The information requirements apply to the lands being developed but must also consider impacts on adjacent areas.

Where ‘setback areas’ are defined on a building lot (e.g., along the ocean front) they are protected by a Restrictive Covenant that limits removal of trees and other natural vegetation. Similarly, defined riparian areas are protected by a Restrictive Covenant. The riparian area is at least 15m wide, or as determined by the Environmental Impact Assessment. Any trees removed must be replaced elsewhere on the lands.

Incentives for environmental protection and stewardship

Density bonusing was provided in exchange for parkland and amenity contributions. Fifteen percent of the lands were lands dedicated as park or made or publicly accessible. In addition, cash contributions were provided towards a community centre, land transfer to the District, construction costs for part of the Wild Pacific Trail, and a variety of community services.

Protection of air and water resources

The MDA encourages the conservation of energy and reduction of waste through buildings that maximize solar orientation and use an energy efficient design. Alternative energy sources and tree retention are encouraged.

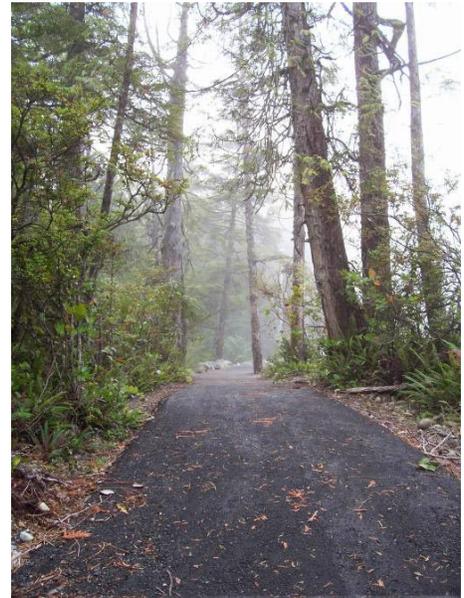
Public input

After significant staff and community participation and review, the agreement in its entirety was adopted as an amendment to the Zoning Bylaw and is covenanted on property title. If changes are proposed at some future time, they can only be considered and achieved through a process of public input and District of Ucluelet Council approval in accordance with the provisions of the *Local Government Act*.

Through the process, elements of the community identified to be of significant importance included the Wild Pacific Trail (WPT). This community asset provides unobstructed waterfront access, displays the character and history of Ucluelet; links the natural environment to the built form of adjacent residential neighbourhoods, resort commercial and neighbourhood commercial areas; is a source of significant community pride and support; and provides access to residents and visitors to recreation opportunities.



Wild Pacific Trail



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Links

Official Community Plan
<http://www.ucluelet.ca/UserFiles/File/Bylaws/OCP%20Jan%2011%202007.pdf>

Weyerhaeuser Master Development Agreement
<http://www.dist.ucluelet.bc.ca/bylaws/Weyco%20MDA.pdf>
Schedule "A" (Bylaw No. 1006, 2005) <http://www.dist.ucluelet.bc.ca/bylaws/Sched%20A.pdf>
Schedules "B" to "K" (includes Bylaw No. 1007, 2005)
<http://www.dist.ucluelet.bc.ca/bylaws/Sched%20B-K.pdf>