

# The role of stewardship in ecological rehabilitation and monitoring, or why using local knowledge and expertise can mean getting it done right in the first place!

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## Abstract

Traditionally, local knowledge and expertise has been left out of the picture in conservation planning and monitoring projects initiated by land use decision authorities or landowners (e.g. private developers and government). Along with this, recent shifts towards back end monitoring and performance based objectives by senior government conservation policy has somewhat led to a reduced ability for approving agencies to determine if projects being implemented are appropriate to local conditions or if problems are being addressed post completion. This requires a leap of faith that things are getting done right and to the benefit of the receiving environment, which may not be the case. Local conservationists and stewards who generally have an intimate understanding and vested interest in the ecological viability of their communities are beginning to advocate direct use of their expertise in such projects both in the design and monitoring stages. The value added component for such partnerships is that there is generally guaranteed commitment from the community to ensure long-term success for projects that goes beyond fee for service or contractual agreements and such involvement is often associated with increased cost effectiveness. This presentation will take a look at how one local watershed conservation group approached the issue, examine what has worked, what hasn't and why, and what responsibilities and level of accountability other local organizations must be prepared to accept if they are planning to advocate for a lead role in such activities. It will also look at some examples within the same area of projects undertaken by private consultants for comparison to demonstrate how local knowledge or involvement may have made a difference in the outcome.

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## **The Traditional Approach to Monitoring: “The Public? What Do They Know?”**

Historically the majority of restoration and monitoring work done in environmental protection and biological conservation has been the responsibility of government staff and/or qualified professional experts from the private sector. Whether it is project monitoring, environmental quality monitoring or trend and effectiveness monitoring the concept of sharing those responsibilities with the public has been an ad hoc one. Where they did occur they were often the result of political decisions made as a result of reactive public response or pressure. What is needed is a more consistent approach that recognizes the true resource value or cost effectiveness of such partnerships, and integrates the role of local knowledge as part of long-term conservation strategies.

Decision makers, land use authorities and regulators are still somewhat caught up in an “us and them” attitude. Though government staff or private consultants may establish close working relationships with individuals or large umbrella organizations, over time this has not transferred out to partnerships that bring together ground level experience. Conversely many non-government organizations (NGO's) are equally averse to sharing such information or working with partners due to concerns they won't be taken seriously or that their input will be misused. There are certainly legitimate reasons (e.g. professional liability, credibility of source data, resource limitations) why government and qualified professionals need to be strategic about their partners. However there is enough evidence that the public have an important and more significant role to play in monitoring and management of biological systems.

## **Integrating Local Knowledge and Expertise—Values and Benefits**

In the deregulated, performance based climate of the provincial and federal government, resources to effectively implement and undertake conservation and monitoring activities have greatly changed from the heyday of fish and game management of the 60's and 70's. Amendments to the Local Government Act, the development of the Community Charter and recent environmental legislative and regulatory changes (Species At Risk Act, Riparian Area Regulation) have all led to greater responsibility and accountability at the municipal and community level. Things have become a great deal more complex when it comes to “who” component related to land use decisions and impacts to habitat and species.

Arising out of this, and somewhat correlated to the growth in local stewardship activities over the last decade, government and the private sector are beginning to rely on citizen and community involvement to fill data gap needs. So what are the benefits?

- Use of outside professionals frequently has little to do with their familiarity of local ecosystem dynamics or conditions and more to do with cost. This inherently places limits on a qualified professional's ability to gauge the processes at work and may reduce the effectiveness or value of management decisions or monitoring data.
- Local government and senior agencies have legislative and regulatory responsibilities to uphold but have limited resources and budgets to undertake many aspects of conservation and monitoring themselves.
- Local conservation groups or “stewards” interact with their environment, watersheds or natural areas almost daily. This level of intimacy results in a

significant pool of qualitative and quantitative information reflecting real time and real world conditions.

- Generally stewards and volunteer efforts are based more on altruism, their involvement whether consciously or not are targeted to protect and improve social, environmental and economic conditions which benefit the community as a whole.
- Integrating local involvement creates opportunities to build the necessary credibility and technical skills of the public into the mix. This further helps to reduce liability concerns and resource demands for the use of outside professional expertise.
- Direct and balanced participation ensures the public has a true sense of ownership in environmental management and decision making, increasing commitment to conservation and continued partnerships development.

## **“Lessons From the Hood:” The Como Creek Watershed in South Coquitlam**

### Case Study Background Area

The Como watershed and the adjacent Nelson Creek watershed are tributaries to the Lower Fraser. Encompassing over 10 km<sup>2</sup> of both remnant coastal western hemlock forested upland to the south of Burrard Inlet and lowland floodplain habitat with associated old-field and wetlands the watershed is east and west of the Coquitlam and Brunette Rivers respectively. This area represents significant natural capital to Coquitlam as well as providing a critical ecological pathway to important municipal, regional and provincial protected areas in Port Moody, Port Coquitlam and Burnaby. Since 1996 the local conservation NGO – the Como Watershed Group (CWG) had typically been securing and allocating approximately \$5,000.00 per year for plant purchases and aquatic habitat restoration, mainly for native salmon and trout populations. The City regularly matched that amount through in-kind contributions of materials, equipment or staff support. Cumulatively efforts cover 8 sites or about 20% of the two watersheds. Including a few large scale projects such as the restoration of the headwater wetlands at Como Lake and considering volunteer time and effort, the investment to date has been close to \$500,000.00.

### *Pilot Project - Booth Creek @ Schoolhouse St. Riparian restoration and monitoring project:*

In 1997 the society began its first partnered project with the City of Coquitlam’s Drainage Department. This project happened because many of the key components fell into place:

- An evolving local stewardship organization with a certain level of expertise and skill sets to make the project happen
- Professionals (local government and senior agency staff) who were open to exploring the opportunity for public involvement

### Project highlights:

The Booth creek restoration project used local expertise and volunteer resources to mitigate the impacts to the floodplain and adjacent riparian area along one side of the channel. The site and total project area treated with planting was approximately 1000m<sup>2</sup>. The CWG was allowed complete responsibility for design, installation and monitoring of the planting component. As work was undertaken on City land, activities were covered under municipal liability insurance.

Restoration objectives as set out by the CWG:

- Re-establish a lowland floodplain forest based on natural successional processes and analysis of historic air photo information
- Create riparian habitat that will provide a net increase in overall biodiversity values while reducing potential flooding through maintaining channel morphology, stability and flow capacity.

City of Coquitlam component:

- Channel reconstruction, site contouring and large scale habitat complexing (large woody debris, engineering designs, materials, machinery)
- Cost of initial consultant involvement.
- Long-term liability coverage

Como Watershed Group component (all costs borne by the CWG):

- Planting plan and plant materials
- Volunteers and supervision
- Long-term project monitoring, maintenance and reporting.
- Long-term liability coverage (since 2001)

Activities:

- Year one (summer/fall 97): After channel work completed and site seeded by the City, first successional "layer" of appropriate plant species put in over several months (~300 trees). Planting plan was designed to maximize site footprint and for existing and potential species use benefits. Photo-point monitoring, and observations of species use (terrestrial and aquatic) on weekly-monthly basis begun. Some of the large woody debris installed initially by the consultant shifted and or displaced. This was noted but not addressed as it would have created greater disturbance to fix.
- Year two (summer/fall 98): Post monitoring review, enhancement of habitat complexing done by the original consultants in year one, plant survival assessment and maintenance. Regular photo-point monitoring, and observations of species use (terrestrial and aquatic) continues.
- Summer 1998/fall 1999 Silver City Theaters development adjacent to the site, developer provides another 500m<sup>2</sup> of upslope riparian habitat.
- Year three: (summer/fall 99): Same as year two, a blind off channel for flood storage and large woody debris to improve sediment transport designed and installed by CWG and City Drainage crew. Beaver management added to monitoring regime.
- Year four (fall & winter 2000-01): Understory of appropriate shrub and herbaceous plant community introduced (approximately 100 plants distributed throughout the site). Invasive species management incorporated to protect shrub placements, silviculture treatment of plantings including selective thinning to promote riparian forest health. One large woody debris placement from the initial consultant work which had become displaced was moved and re-anchored based on suggested placement by the Society.
- Year five to present (2002 -2004): Monitoring of ongoing successional processes, species use (terrestrial and aquatic) throughout the year, continued vegetation management during the winter. This includes both the Silver City Theaters and City owned lands.

Present state of site:

- Beaver use has impacted some plantings, but has also provided some beneficial thinning and pruning and increased habitat complexity. Planting survival rate is estimated at 90-95%.
- Both species selection and planting plan have achieved desired results of jump starting succession and increasing site diversity in a short period of time.
- Net increase in bird and mammal species use including some provincially listed species.
- Fish species composition has stayed constant and the area is now being used by otter.
- Re-establishment of a shade canopy has reduced invasive species colonization (reed grass and Himalayan blackberry which was contributing to channel infilling and flooding)
- Channel profile and morphology has remained stable, including overall capacity for flood storage.
- Some of the initial complexing done by the consultant displaced (partially and completely) and has been removed or re-anchored by the based on suggested placements by the CWG.
- Photo-point monitoring and data recording of species use now being used to guide a comprehensive restoration strategy for the surrounding area.

Learning outcomes provided by the CWG after seven years:

- Use nearby sources of plant materials with similar soil/moisture properties contributed to long-term planting success.
- The ability to monitor frequently increased the ability to understand and deal with changes in system dynamics, species interactions and improve on original designs and objectives.
- Objectives based on improvements for a single species (e.g. salmon) which are driven by costs constraints and do not incorporate improvements for overall ecological diversity will probably not result in any net biological gain.
- Resources must be secured and committed to for long-term vegetation maintenance, monitoring and invasive species and beaver management.

City contribution to date has been limited to in-kind provision of planting materials. The Society has provided all other services free of charge.

### **Meanwhile Downstream**

The following year (summer/fall 1998) the City under a capital works project (not the same department the CWG worked with) was required to provide compensation for fish habitat loss on Booth Creek due to the installation of an upstream culvert. The City retained the services of the same consultant who had been involved at the outset with the work the Society had taken over upstream. The site selected for the compensation was immediately downstream of the Society's project area. However with this particular project the CWG had minimal involvement in the project design and was not asked to undertake any aspect of the works. As well the instream works did not employ any design components of floodplain restructuring as occurred upstream. Once approvals were obtained work began the following year (summer 1999). The total area treated for planting ~75m<sup>2</sup>, total project area was the same as upstream 1000 m<sup>2</sup>.

City component:

- Large scale habitat complexing (large woody debris, machinery and crew).
- Cost of consultant for works and 5 years of monitoring
- Approvals
- Long-term liability coverage

Consultant component (all costs born by the City):

- Compensation design
- Plant materials and crew
- Works and bi-annual post monitoring
- Annual reporting
- Short-term liability coverage

Restoration objectives as set out by the Consultant:

- Provide off-site fish habitat enhancement as compensation for fish habitat losses upstream through removal of invasive plant species, replacement with a native riparian plant community and instream placement of five rootwads.

Activities:

- Year one (summer 1999/winter 2000) clear upslope area of site, install 195 shrubs and 18 trees and five rootwads instream. Within one month of works being completed several rootwads displaced during first high water event and had to be re-installed and or replaced. Bi-annual fish sampling commences January 2000 along with photo documentation.
- Year two (summer 2000, winter 2001): Bi-annual site review - plant survival checked, invasive blackberry removed and fish use assessed, photo documentation and annual reporting continued.
- Year three: (summer 2001/winter 2002): Bi-annual site review - plant survival checked, invasive blackberry removed and fish use assessed, photo documentation and annual reporting continued.
- Year four: (summer 2002/winter & summer 2003): Bi-annual site review - plant survival checked, invasive blackberry removed and fish use assessed, final year for photo documentation and annual reporting on riparian component. Consultant's long-term recommendations are for adding 3 more trees to meet agency survival rate requirements.

Present state of the site:

- Rootwads are stable; channel is still subject to bank failure.
- Blackberry has become a problem and is threatening to overtake riparian plantings.
- Reed grass has overgrown the channel.

Learning outcomes provided by the consultants after four years:

- Salmon and other fish species were present in the site before, during and after the project was undertaken.
- The City will need to put in three more trees to meet agency requirements.

## **The “so what” factor**

How has integrating a local stewardship partner into the mix made a difference in the results of these two projects?

- If the same planting plan and post monitoring regime done by the consultants was used there would have been little net gain in long-term species and plant community diversity.
- Invasive species would have become re-established and taken over the site.
- The City’s objective to stabilize and improve channel capacity would have likely shown only short-term improvements, potentially requiring further invasive procedures and disturbance again.
- Beaver damage may not have been identified and likely would have had far greater impacts; steps taken to work them into long-term management for the site may not have been considered, again losing on opportunities to enhance overall biodiversity (working with nature approach).

Both the City and the Society have learned a great deal from these projects. Even with some heated disagreements and consultative struggles, the relationship derived from the partnered project has continued to grow. The success of the work undertaken by the CWG compared to that of the consultant has created the necessary “credibility” comfort level for the City. This has allowed further projects to be lead by the Society since resulting in more comprehensive and effective results based activities. This last point has perhaps been one of the key components to making this public-private approach work.

## **Conclusions: The necessary pieces of the puzzle**

Though local knowledge and more specifically local stewardship expertise are increasingly being recognized as valuable and useful there are still some challenges to making such partnerships effective. It’s important to recognize that local skilled expertise is not always going to be there, nor will NGO’s always have the capacity to lead projects. There are also serious liability issues which have to be considered before such partnerships can be established. Most important is the need for adequate resources to be in place to ensure that the ability to do the long-term monitoring exists.

However what examples like those from the Como watershed demonstrate is that there needs to be some changes to the standards and quality assurance reflected in contracted restoration and monitoring services. Achieving a long-term gain in ecological function and biological diversity requires an intimate understanding and adaption capability to changes in ambient conditions. This can only be achieved through stronger commitment and investment in frequent and periodic monitoring. Typically such practices are not consistently applied by outside professionals under the sometimes limiting constraints of a proponent’s budget.

Using local knowledge and expertise and directly involving the community may mean the difference between getting it done right in the first place and reducing or eliminating future costs associated with maintenance and liability. More importantly such partnerships can achieve a greater diversity in net benefits while improving knowledge of environmental conditions. That means being more effective in our conservation and management decisions for the long-term.

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