

Blenkinsop Valley, Saanich, BC, Canada

Stream restoration of a farm ditch. Improved productivity, land area, wildlife, utility, public access; reduction in pesticides, vandalism, roads & bridges. Government-sponsored demonstration project, financial benefit not valued. Negligible market value but net profit to business, community and ecology justifies project. Project won the 2002 Federation of Canadian Municipalities / CH2M HILL Sustainable Community Award.

OUTLINE

A farm ditch separated a field into two parts, requiring road and bridge access for cultivation. Its location impacted farm utility by bisecting the field, creating narrow access for farm vehicles, resulting in cultivation difficulty and increased maintenance. The ditch comprised part of Upper Blenkinsop Creek, a major tributary to Swan Lake, an urban lake surrounded by a nature sanctuary in the middle of the Municipality of Saanich, British Columbia, Canada.

Recommendations and a proposal for restoration by consultants Aqua-Tex Scientific Consulting Ltd. resulted in an award-winning demonstration project to restore lost stream function and fill the original ditch. Completed in 2002, the stream was relocated adjacent to the property boundary, which comprised a former rail line, now part of the municipal trail system. The project was sponsored by the District of Saanich, British Columbia.

The main objective was to restore ecological function to a 650 m length of the creek. It also demonstrated Proper Functioning Condition (PFC), a US-developed¹ method of evaluating riparian condition. The project showed that watershed restoration could gradually be managed as opportunity arose, using PFC as a metric to guide and measure achievement. The project successfully met the goals.

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Figure 1: Ditch prior to restoration, early 2000

¹ USDA Forest Service and USDI Bureau of Land Management. See [USDA web site](http://www.usda.gov).

The project cost a total of C\$375,000 according to Aqua-Tex. Accounting review showed a slightly lower cost but may have omitted some undeclared contributions in kind. The benefits were considered appreciable and summarised by the project team as follows:

- Single field with one irrigation system
- One road with no bridges
- Enhanced biodiversity
- Reduced pesticide use
- "Moat" reduces vandalism
- 13% more arable land
- Stream sinuosity restored, benefiting floodplain
- Reduced downstream flood risk & erosion
- Improved water quality
- East-west trail connector created
- 40% less potable water consumed for irrigation

The project has been extensively written about in a variety of areas across Canada and the United States. However no financial benefits were originally claimed or analysed and the beneficiaries were the farm, the public and nature. A review showed that financial benefits existed, however historic data was not segregated to permit analysis, but agglomerated in general accounts. Two main financial aspects could however be identified:

- Restoration increased cultivatable land by approximately 1.5 acres. Based on land sales at 2007 values, suggests a net benefit to the land of C\$50-60,000/acre or perhaps C\$75-90,000 in total. Agricultural land values do not appreciably fluctuate in this location;
- Pesticide use had fallen as habitat restoration and improved irrigation meant that pests were controlled by birds etc. This impacted the fields totalling approximately 21.4 acres on the Galey's farm, and presumably benefited other lands. The savings were represented as amounting to some C\$1,650 per acre per annum. Using a conservative discount rate (to reflect the secure nature of the benefit), suggested savings of C\$495,000.

Other aspects such as reduced water use could have been analysed to provide a financial analysis but the lack of separation from other parts of the farm's business meant meaningful analysis was not possible. However pesticide savings alone justified the project.



Figure 2: Location Saanich, BC, Canada

The land value benefit is clearly insufficient to justify the project however the benefit to the business of farming is sufficient to yield a net profit, irrespective of other benefits. Further comment on this is provided below.

INTERPRETATION

The project was funded by local government with private/corporate and community contributions both in kind and financially. However not all contributed equally or benefited in proportion to their investment (time, financial and other aspects). Nor were the risk/rewards distributed to a normal commercial pattern. Review suggests that while the financial cost has been well estimated, it is unlikely to reflect all the contributions to the project, or returns.

In financial terms, undiscounted, the project yielded an approximate 28% cash-on-cash return on investment. Figures were not available to calculate with certainty an accurate Return on Investment (ROI) or Internal Rate of Return (IRR). By estimation it appears to be achieving approximately a ten year payback. By normal standards this may be deemed a protracted return however (a) the benefit is reasonably certain to continue; and, (b) other benefits would improve this return.



Figure 3: Project Plan

In effect and somewhat unusually therefore, the project's results exceeded those claimed. This is not due to modesty but because the business case was not tracked or expressed in valuation terms, therefore those involved were unaware of the underlying additional claims that could have been made.

In terms of risk, financial contributors only had money to lose and the greatest contributions were taxpayer-funded. The farmer took the greatest risk of the project not working, forcing increased long term cost and other impacts. Risk aspects were not cohesively captured before, during or after the project.

Prior to the project, farmland had flooded regularly, impacting farm productivity and downstream residential areas during major storm events. While there was additional public sector risk had the stream turned out to contribute to flooding, this risk was mitigated by design and initial storm impact shows the project has benefited flood prevention, something not accounted for in either the risk evaluation or the net benefit calculation.

The stream retains more water than the ditch, whose function was to move water off the land quickly. This does not impair drainage during storm events but by reversing the drainage pump during the dry season, means the stream can be used to irrigate under a water license, thereby reducing municipal water demand, in turn defraying costs for major infrastructure such as dams. Employed on a wider basis, this may start to have an appreciable effect in reducing costs, but the farmer's accounts were not structured to permit the benefit to be calculated.

Another aspect is that the stream increased the vegetation in the riparian zone. This has the effect of "fixing" carbon and through transpiration, improving atmospheric oxygen. This benefit was not quantified but may now be, as it was recently identified as a benefit. It would increase the ecological value of the project.

Due to the success of this project, the farmer agreed to dedicate a trail right of way which permitted the municipality to create a public trail linking the other side of the valley, built at public cost. However this has had several benefits. Firstly, the stream and trail have reduced vandalism that used to occur from attempted crossings of the field, the public now use the trail. Secondly, the trail has increased cycling and walking and it is thought this has had a slight benefit on traffic, reducing carbon emissions while improving public health through improved activity.



Figure 4: Creek under construction

Impediments were identified to the project. Certain aspects of the project could have caused substantial delay (largely due to federal and municipal statute and bylaws). However decisions were taken to proceed due to the project's demonstration nature but would otherwise have hampered or stopped the project.

VALUATION ASPECTS

There is appreciable research and information on the value of riparian and green zones. Many factors are identified as affecting value and there is a range of academic definition of the differing recipients and ways to categorise both cost and value². However the range of values found makes methods such as hedonic pricing insufficient on its own: several methods can be applied to each component aspect of value and their recipients.

Firstly, some discussion may benefit of the less-proven but rising valuation methods that might be considered to address broader definitions of environmental and public value. For example the Contingent Valuation method attempts to rationalise non-monetised value aspects in effect using opinion surveys.

² A starting point for this is a paper by S. Hamilton & M. Quayle, University of British Columbia, entitled "[Corridors of Green and Gold: Impact of Riparian Suburban Greenways on Property Values](#)" published by Canada's Department of Fisheries and Oceans in 1999. Considerable other academic texts exist.

Secondly, the social value concept addresses some of the aspects of benefit identified in this case. These methods may help in reconciling public response and benefit to the improved trails system and related visual aspects but has not been used here as the benefit is not directly tradable and quantifying under these methods exceeds the current scope. Some applications use mathematical modelling such as the Monte Carlo method but application is unlikely to be used to determine market-related value (in use or in exchange). In Case Study 3 (Vancouver Island Technology Park), community-related benefits had a value equivalent (reduced municipal process) but this did not apply to the subject project. Lastly, there is the concept of public value.

Determining the social or public value of carbon sequestration through increased ecological function was not undertaken but is now proposed. This may later help add information on the value of the project and be capable of extension to other projects.

Turning to more traditional methods of assessing value, a land sales comparable approach could be undertaken and showed a value of up to C\$90,000. Pesticide savings used a discounting (PV) method to calculate reduction in pesticide use. While a comparable approach would not have justified the project, a business-oriented approach identifying the cost savings of one aspect alone, is sufficient to justify the project. On the face of it the net fiscal benefit of this project is at least C\$100,000.

A standard highest and best use valuation of market value to the land would have been inadequate, but is standard practice and meets the Canadian Uniform Standards of Professional Appraisal Practice, the typical standard for this jurisdiction³. Most local appraisals are solely focused on land value and do not adjust for other accounts than the market highest and best use and value. None habitually include analysis of the entire range of wider public or business benefit seen in this example, or consider impact to the environment except where the asset is contaminated (usually termed "impaired").

A normal valuation/appraisal approach does not often address underlying project risk and include it in the evaluation, nor did the project team in this instance. Lending institutions do not typically require a risk assessment as part of the normal appraisal, which usually addresses variations on market asset security



Figure 5: Completed creek late 2002



Figure 6: Same view, mid-2006

³ Canadian USPAP is governed and published by the [Appraisal Institute of Canada](#). It is based on the US-developed USPAP, governed by the [Appraisal Foundation](#), a body funded by US Congress.

but not all appraisers consider the underlying need spurring the loan and appraisal: the business enterprise for which the loan is sought.

While pesticide savings proved sufficient to justify the project, enquiries suggest this does not pass through to improve market value. There is not thought to be market demand for sound riparian condition, generating evidence of value, probably largely because the issue of natural solutions to herbicide and pesticide use are not an appreciable factor in the sale of farmland. Farm businesses are under fiscal pressure from imports and the benefits are absorbed by the farmer rather than increasing market value for the land.

Several aspects thus suggest that the value of a project is not captured in a traditional market value methodology and that a standard appraisal would have caused the project to be rejected. However the broader business case of benefits impacting the farmer, the environment (and thereby people), and the community, were orders of magnitude larger than the land value benefit. They exceeded the project cost.

CONCLUSION

While the cost and outcomes were monitored and the project a notable success, the financial benefit was neither tracked nor claimed. This weakened its ability to prove its value, limiting the possibility that more such projects would be undertaken.

The project would have benefited from a pre-construction and pre-funding 'holistic valuation' to generate a business case and post-completion evaluation of the project's success. Equally clearly, a standard appraisal would not have demonstrated the project's worth because it does not usually account for the costs and benefits paid and received across the multiple accounts that exist for this project.

Traditional valuation analysis is of a "single perspective," for example that of the farmer. However this project shows that there were multiple beneficiaries of the single investment. This goes beyond "Triple Bottom Line"⁴ which speaks to evaluating a single perspective by three or more accounts: economic, ecological/environmental and social. In this instance there is a clear need to consider a "holistic valuation" that values using "three-dimensional accounting" – where each of the triple bottom line accounts needs evaluating for each contributor and recipient, factored for time.

⁴ See John Elkington's "[Cannibals with Forks](#)", New Society Publishers (September 15, 1998).