



Asset Management Newsletter

SIXTEENTH EDITION – WINTER 2016 ISSUE



Eco Strategies “Why we need to integrate natural capital into asset management”

By Emmanuel Machado, CAO, Town of Gibsons; Roy Brooke, Brooke and Associates.

Many municipalities think of assets as engineered or ‘grey’ infrastructure such as roads, sewers and buildings, and execute asset management processes accordingly.

This is only partially true.

There is increasing evidence that municipalities can reduce risks further, and save more resources, by also considering natural assets such as wetlands, forests, foreshores and rivers in their asset management processes.

Protecting and managing nature to provide municipal services is not new, of course, as an example from New York City illustrates. Much of New York’s water is drawn from the Catskills and Delaware watersheds. In the 1980s, concern about contamination led to an Environmental Protection Agency requirement for surface water filtration. Instead of building a water purification plant, however, New York tried watershed improvements and restoration. These provided the desired result – clean drinking water – at a fraction of the cost of an engineered asset: restoration cost about \$1-1.5 billion, whereas a filtration plant would have cost \$6-8 billion and required \$300-500 million/year to operate.

The problem with such examples is that, historically, they have been hard to transfer from one municipality to the next.

However, the apparent synergies between asset management processes and the measurement and management of natural assets may change this. It turns out that standard asset management processes (see Figure 1) lend themselves remarkably well to the measurement and management of natural assets, which makes it practical for municipalities to use the approach.



Figure 1: There are strong synergies between asset management processes and the management of natural capital.

The Town of Gibsons, BC (pop. 4400), provides an example of how this looks in practice.

Gibsons must protect its business and infrastructure from the sea; manage run-off from nearby mountains; and, prepare for climate change such as increased

temperatures, precipitation and sea-level rise – and, of course, contain costs. To achieve this, the Town is applying the same asset management process they use for traditional engineered assets to natural assets such as their woodland, creeks and foreshore. This includes *assessing* natural assets with the help of the David Suzuki Foundation using open-source modeling software, *planning* based on the results of the assessment, including developing scenarios that demonstrate the effects of land-use on natural assets, *implementing* strategic and operational plans for key natural assets, and *developing* inter-disciplinary teams to manage the assets.

“The approach is based on a Town policy that deems nature a municipal asset and gives it the same consideration as traditional capital assets,” says Gibsons Director of Engineering Dave Newman. “Nature has no capital costs and if we manage it properly, provides core municipal services far cheaper than the operating expenses we would pay for an engineered alternative to provide the same services. The evidence to date shows that this approach gives us a lower-cost and efficient asset inventory, one that provides numerous non-financial benefits also.”

The approach is gaining interest. A wide group of stakeholders participated last fall in the first phase of the Municipal Natural Capital Initiative, which seeks to adapt and replicate approaches that integrate natural capital into asset management processes. As part of this, the Town of Gibsons, together with the David Suzuki Foundation, Sustainable Prosperity, Brooke & Associates Consulting, with financial support from Tides Canada and Vancity Credit Union, convened representatives from the organizations listed in **Box 1** to create the basis for municipal pilot projects in BC and beyond.

“Now that we have input and concept validation from stakeholders, the next phase is to launch municipal pilot projects in BC and beyond,” said Roy Brooke, who is acting as project manager for the Municipal Natural Capital Initiative. “This will include developing tools to guide municipalities; providing support throughout the process of identifying, assessing and planning related to natural assets; and ensuring peer-to-peer learning.” The results of the pilots should enable many more municipalities to start adopting the approach.

A call for non-binding expressions of interest will be issued in late January 2016 to determine more precisely which municipalities want to launch a pilot and dialogue is ongoing with a number of potential funders. Assuming

that the project receives funding, formal letters of intent will be requested from municipalities and pilots would start in June 2016.

Box 1: Participants in the Autumn 2015 Municipal Natural Capital Workshop

- Alberta Land Institute;
- BC Real Estate Foundation;
- Capilano University;
- City of Courtenay;
- City of Nanaimo;
- City of North Vancouver;
- City of Port Moody;
- City of Surrey;
- City of Vancouver;
- Corporation of Delta;
- Credit Valley Conservation Authority;
- District of North Vancouver;
- Earth Economics;
- Federation of Canadian Municipalities;
- Lintott Architects;
- Metro Vancouver;
- NAMS;
- Partnership for Water Sustainability in BC;
- Planning Institute;
- Province of BC;
- The Natural Step;
- Township of Langley;
- UBC

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Eco Strategies continued

The natural synergy between asset management and measuring natural capital means that municipalities starting out on their asset management journey may soon be able to readily integrate information on natural assets into their work from the start. Municipalities that are already using asset management processes will be able to integrate natural capital information into their existing work. As Wally Wells, Executive Director of Asset Management BC concludes, “The integration of natural capital information is an important evolution in asset management and an important opportunity to embrace in the months ahead.”

Getting the Most from Infrastructure Assets: The Idea of Ecological Accounting

By Tim Pringle – Director & Past-President, Partnership for Water Sustainability in British Columbia & Chair, Ecological Accounting Protocol Project

Outcome-oriented, **Asset Management for Sustainable Service Delivery: A BC Framework** (The BC Framework) points the way to integration of natural systems and climate change thinking into asset management.

The **Ecological Accounting Protocol** project will address the challenge of determining financial values for goods and services drawn from natural systems. The emphasis is on ‘civil services’ that provide a municipal function. The project will be undertaken by the Partnership for Water Sustainability in 2016-2017 as a deliverable for the Georgia Basin Inter-Regional Education Initiative (IREI).

This article (the first of two) discusses the importance of devising an ecological accounting protocol and the valuation issues that arise. Part two will focus on how the protocol would enable full risk and opportunity assessment of all assets owned by and available to local government.

Human settlement always depends on natural assets for basic needs. Local government, at least in BC, commands the greatest influence on the use of civil services that may be drawn from natural assets.

In this article we explore what this process looks like on the ground in the context of site development and drainage (horizontal infrastructure) and The BC Framework.

Emphasis is on hydrologic functions, the primary natural form maker in watersheds and a key consideration in the process of land development, also a form maker in watersheds.

It is a question of using opportunities provided by all assets

A number of practitioners in the engineering and land use field have written about the limitations of design and installation of horizontal infrastructure, especially for protection of hydrologic function and integrity.

Principal concerns include incomplete data and emphasis on the site using limited reference to the greater watershed context (Andy Reese, *Voodoo Hydrology*; Jim Dumont, *Water Balance Methodology*; Patrick Condon, *Urban Design-UBC*; Emanuel Machado, CAO Gibsons, BC, *Eco Asset Strategy*)¹.

Think like a watershed... In BC most local governments have opportunity to draw on civil services, especially management of rainwater (stormwater), from natural assets.

By devising and adopting strategies to use streams (conveyance), ponds (retention), wetlands (water quality, aquifer recharge, release rates), tree cover (interception, infiltration), and soils (conveyance and infiltration) local governments can connect development sites to the watershed and likely reduce long-term management costs of infrastructure.



Such strategies allow retention, use and management of natural assets while securing amenities attractive to

¹ Partnership for Water Sustainability in BC, 2016; http://waterbucket.ca/rm/files/2013/02/Andy-Reese_Voodoo-Hydrology_Pitfalls-What-Need-to-Know_Feb-2013.pdf.

community needs and the value of real estate development. The BC Framework is outcome-oriented and is “the catalyst for local governments to integrate natural systems and climate change thinking into asset management.”

The practical challenge... Strategies for sustainable service delivery based on asset management can be more successful over the life cycle of infrastructure if both engineered and natural civil services are utilized. The challenge is how to calculate the most effective blend of these options. Of course the need for measurement and valuation is paramount. While engineered services involve expenditures that are readily accounted, those drawn from nature do not have commonly accepted measures and values.

Let’s posit that ecological accounting is the process needed for this challenge. We explore the idea in the final sections of this article.

Using civil services from nature is not a new idea

Use of services from natural assets to support community prosperity rarely gets the respect it deserves. Why worry if the source appears to free? Yet, historic realignments occur as in the case of the Agricultural Land Reserve Act BC (1972), a broad stroke asset management strategy which regulates defined lands and soils for agricultural purposes excluding other uses that might be more lucrative.

Back to the future... Industry also may recognize the importance of managing natural assets. In the early 1900s, the Vancouver Power Company (VPC) and the BC Electric Railway Company (BCERC) were involved in a common venture to dam the Coquitlam River to create an impoundment for generation of hydroelectric energy for the BCERC, three cities, and potable water for the City of New Westminster.

In response to pressure to log the watershed in 1905, R.H. Sperling, General Superintendent of VPC wrote to James Lemay, Crown Timber Agent:

“I consider that the removal of timber would seriously affect the present annual rainfall in the vicinity of Coquitlam Lake. I consider that if logging or shingle bolt cutting were carried on, that the danger from fire sweeping that part of the country, would be very great indeed, owing to the amount of debris left on the ground, as a result of such work and that if a fire were to spread over the area immediately surrounding Coquitlam Lake,

destroying the timber thereon, it would undoubtedly affect the storage of the water there, by reason of lessening the precipitation and causing the early melting of the snow which falls in considerable quantities on the hills in that vicinity during the winter months. The snow, if protected by the shade of timber, would run off slowly but if the timber were removed, the snow would go off with a rush, carrying with it all kinds of debris, depositing same in the Lake, thereby defiling the water supply of the Cities which consume it. The removal of the timber would, I consider, lessen the storage of water, by at least 25 per cent.”



Photo Credit: Coquitlam River Roundtable

Subsequently, the provincial government protected the watershed from logging. On March 3rd, 1910, the federal government passed an Order-in-Council creating a 56,000 acre forest reserve in the Coquitlam watershed. The assets of these early industries are owned now by BC Hydro.

Current local government initiatives

Today several local governments are taking measures to include natural assets more systematically in their strategies for asset management.

- The Town of Gibsons has adopted an “Eco-Asset Strategy” which considers “nature to be the town’s most valuable infrastructure asset.”

Gibsons’ natural capital assets, and the ecosystem services they provide, are a fundamental and integral part of the Town’s infrastructure. Natural capital assets provide clear advantages over engineered (or grey) infrastructure. They:

- are cheaper to operate and maintain, if not degraded;
- may provide “free” ecosystem services;
- do not depreciate if properly managed;
- are carbon neutral or even carbon positive.

(source: Town of Gibsons Website)

- The Cowichan Valley Regional District’s (CVRD) *Areas of Focus* for the next three years include watershed management plans, watershed governance structures, and realizing increased water storage in Cowichan Lake. In one local watershed which supplies potable water, the CVRD is purchasing land to protect its natural integrity.

Of course local governments often mimic nature (design with nature) to secure infrastructure services.



Image Credit: Carrie Baron, City of Surrey

- The City of Surrey continues to rehabilitate wetlands for water retention and stream protection as well as adding amenity value to local parks and real estate
- Increasingly, a number of local governments favour development that involves infrastructure design that maintains the hydrologic function of sites using tools such as the Water Balance Model.

At the same time, it appears that only a few leaders in local government talk about the importance of using civil services drawn from natural assets to put in place an infrastructure that costs less and lasts longer than one based primarily on engineered infrastructure. However, the later strategy is our current heritage. What are the arguments for changing traditional approaches?

The BC Framework provides opportunity to change traditional approaches

The first argument is that The BC Framework sets the stage for local government to devise new strategies

through assessment, planning and implementation. There are no restrictions on including in this process, civil services drawn from natural assets.

The summer 2015 edition of *Watermark* magazine (BC Water and Waste Association) published the article **Asset Management for Sustainable Service Delivery: Supporting the vision for natural systems thinking into “The BC Framework”**. The authors assert that:

“The BC Framework points to a holistic and integrated approach to asset management. Nature, and the ecosystem services that it provides, are an integral part of a community’s infrastructure system. This is not to suggest that all ecosystem services provide a municipal function. Trees, soil, green spaces and water do contribute a valuable municipal function in maintaining the hydrologic integrity of a healthy watershed. Thus, the ultimate vision for sustainable service delivery is that communities would protect, preserve, restore and manage these natural assets in the same way that they manage engineered assets.” (p 24)

The second argument is that most BC communities have access to relatively healthy natural assets. Using civil services from nature is feasible and ultimately practical. Metro Vancouver enjoys sources of reliable, uncontaminated potable water due to decisions made more than 100 years ago to protect source watersheds from degradation by human activities.

The third argument is that natural assets provide opportunities to make infrastructure design, construction and management less costly in the long term. Natural assets do not depreciate if properly managed. And, these assets are carbon neutral and can be carbon positive.

It makes sense for local governments to consider using when possible civil services supplied by natural assets. What balance of engineered and natural assets might be optimal? Let’s consider this question.

Ecological Accounting – an idea whose time has arrived

Services drawn from natural assets ought to be a measured part of drainage and other horizontal infrastructure (institutional sites, parks, trails, airports, reserves/buffer areas, etc.). If not, opportunities may be missed.



Increasingly, local governments find their efforts to assess available assets frustrated when considering natural assets. Not only are such assets (natural systems) typically located in more than one jurisdiction, there are few generally accepted measures to value them as well as the services drawn from them.

Assets that are not clearly “owned”, described and quantified are difficult to value. Historically the result has been that what is not measured is not managed.

Accounting vs economics... Ecological accounting differs from ecological economics. The latter is a field of enquiry researched by many agencies and scholars including in BC Nancy Olewiler (Economics Simon Fraser University) and the David Suzuki Foundation.

The Canadian Society for Ecological Economics and similar international organizations work to influence policy and standards related to the recognition and imputed value of natural assets and the services they provide to human settlement, flora and fauna. Ecological accounting proposed here would deal with specific civil services drawn from natural assets in local watersheds and utilized at various sites and/or throughout a community.

“The Federation of Canadian Municipalities (FCM) estimates a local government infrastructure deficit of \$123 billion increasing at \$5 billion per year. This cost has escalated over tenfold from \$12 billion in 1985 to \$60 billion in 2003 due to the accelerating combination of aging infrastructure and continuing deterioration. In addition, local governments receive only 8 cents on the tax dollar –the province gets 42 cents and the federal government gets 50 cents. Since local governments own 50 % of community infrastructure, local governments are facing a fiscal crisis.”

Source: Kim Fowler, “Local Government Land Use and Asset Management in BC” citing Mizra Saed, “Danger Ahead: The coming collapse of Canada’s municipal infrastructure”, Federation of Canadian Municipalities Nov. 2007, p. 2.

Local government owned capital assets impose burdensome levels of cost to manage and replace infrastructure over life-cycles. Drawing services from natural assets has the advantage of adding little or no capital costs while deriving desired services.

There appears to be little existing research to describe the cost of managing natural assets compared to

engineered assets. Ecological accounting faces the challenge of monetizing natural assets and services in a way that can be compared to engineered assets and services.

Ecological Accounting – describing, quantifying and valuing

Some natural assets used by local government to provide civil services are valued and appear on the balance sheets. For example, lands for watershed protection or for wetlands and retention areas in parks and natural areas often are owned and, thus recorded in financial statements. However, some of these lands are recorded at nominal values and bear no relation to market values for them if used for development purposes.



Photo Credit: Carrie Baron, City of Surrey

The management costs (maintenance, insurance, water quality control security, etc.) typically are not separated from general departmental budgets; but, they could be in order to reflect actual outlays for this work as part of an ecological services account. In the early stages (years) of adopting ecological accounting, local government could create proxy accounts that present the financial realities associated with use and management of natural assets to provide civil services as a strategic component of infrastructure and sustainable service delivery.

No doubt tax payers would appreciate knowing that natural assets were a strategic part of infrastructure with the advantage of reducing capital investment and replacement costs as well as (probably) reducing management outlays.

Valuation

It takes a community to manage natural assets. The concepts of goods and services ought to be clarified. Valuing a forest as potential lumber (goods) is vastly different from viewing it as habitat, aquifer recharge zone, potable water source, etc., which are desired services. But how should the cubic meter of water drawn from the watershed be valued?

Local governments know the costs of maintaining impoundments, debt servicing, treatment, pumping and delivery (pipe systems). Because some of the watershed

lands are owned privately, should the owners expect rent income in exchange for keeping the land in healthy condition?

In the case of engineered assets, professional services, labour machine work, pipes, catch basins, pumps etc. all have costs that become capitalized, together with the land, into the final sales price of the homes, commercial space and other real estate development.

There is no parallel for the value of civil services drawn from nature. There is no place for nature on the balance sheet.



Risk vs opportunity... A further challenge to valuation is the reality that engineered assets are controlled by the designers, installers and ultimate owners who will have to manage and eventually replace the goods.

Ecological services depend on natural asset conditions – almost always a system (streams, wetlands, forest, etc.) – in a watershed whose lands are owned and/or controlled by more than one entity. Future conditions may be unpredictable due to land owner activities, suggesting levels of risk as well as opportunity.



Photo Credit: Town of Gibsons

At the same time, natural assets may adjust to climate change continually, while engineered assets cannot. Clearly, these assets present long-term risks as well.

Conclusion

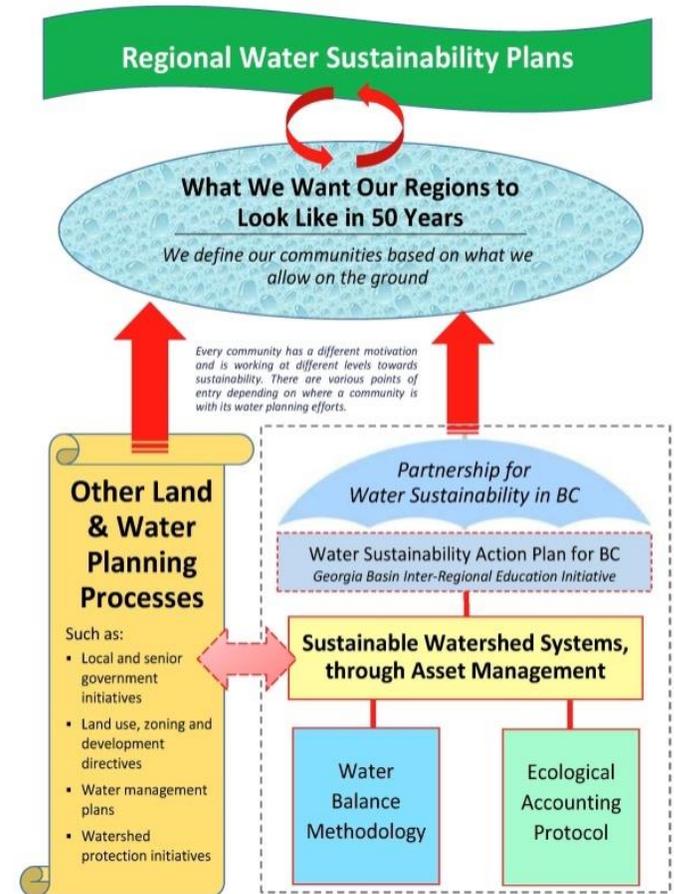
An **Ecological Accounting Protocol** will be a tool to support the full risk and opportunity assessment of all assets owned by and available to local governments.

Looking ahead, it is envisioned that use of the Ecological Accounting Protocol would help support regional water sustainability planning processes in British Columbia. This

outcome would be consistent with the policy objectives of the Water Sustainability Act, passed in 2014.

Figure 1² conceptualizes the multiple land and water processes that can be at play in a region. Going forward, the twin technical pillars of the IREI program will be the Ecological Accounting Protocol (to be developed) and Water Balance Methodology (existing). Adopted by the Province in 2002, the Water Balance Methodology provides practitioners with guidance for protection of hydrologic function and integrity.

In summary, the best blend of engineered assets (infrastructure) and natural assets (that provide ecological goods and services) would support a robust long-term asset management plan and the required financial commitments.



⁴ Partnership for Water Sustainability in BC, Beyond the Guidebook 2015: Moving Towards “Sustainable Watershed Systems, through Asset Management”, November 2015, page 156, http://waterbucket.ca/viw/files/2015/11/Beyond-Guidebook-2015_final_Nov.pdf