



Making Nature Count

MUNICIPAL NATURAL ASSETS INITIATIVE: RESULTS FROM THE FIRST NATIONAL COHORT

DECISION-MAKER SUMMARY

JULY 2018





INVEST IN NATURE

The Municipal Natural Assets Initiative (MNAI) is changing the way municipalities deliver everyday services, increasing the quality and resilience of infrastructure at lower costs and reduced risk. The MNAI team provides scientific, economic and municipal expertise to support and guide local governments in identifying, valuing and accounting for natural assets in their financial planning and asset management programs, and in developing leading-edge, sustainable and climate resilient infrastructure.

Acknowledgements

This report is a summary of MNAI Technical Reports prepared by the MNAI Technical Team and Pilot Project communities

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Convening Organizations



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Decision-Maker Summary

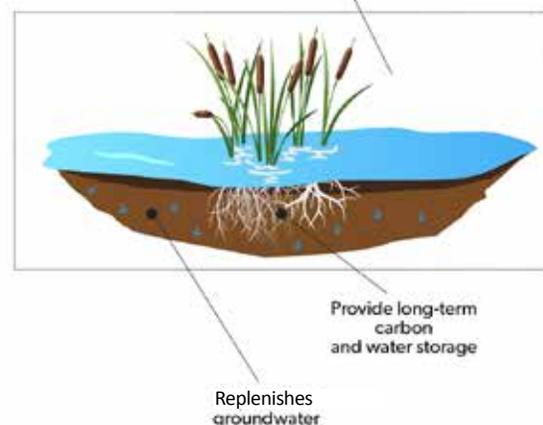
Local governments across Canada are focusing on sustainable service delivery – delivering core municipal services in a socially, economically and environmentally responsible manner. Asset management best practices are key to this; they provide a rigorous framework for addressing aging infrastructure assets and rising maintenance costs, and allow local governments to manage risks to reliable and cost-effective delivery of core services such as water, sewage, and transportation.

Natural assets, such as wetlands, forests, and creeks, provide many of the same services to communities as engineered assets. A wetland, for example, provides stormwater management and flood mitigation services that would have to be replaced by an engineered alternative if the wetland was lost. However, while natural assets are key to sustainable service delivery, they are generally not accounted for and/or are undervalued in asset management practices.



Figure 1: A wetland provides a number of core municipal services that go unrecorded or under-valued because they are not viewed in the same light as engineered assets even though they are providing equivalent services.

Any municipal asset management plan that does not include natural assets omits potentially significant dimensions of a community's financial risk. When the Town of Gibsons, BC, developed their asset inventory they identified the Town's natural aquifer as a key municipal asset, providing residents with drinking water today and 50 years in to the future. If the aquifer were ever compromised the Town would be responsible for finding an alternative source, at significant cost to taxpayers. With this understanding, in 2014 the Town of Gibson's became the first North American town to recognize natural assets as municipal assets, allotting them the same operations and maintenance status as all other assets.



What are municipal natural assets?

Municipal natural assets refer to the stock of natural resources or ecosystems that is relied upon, managed, or could be managed by a municipality, regional district, or other form of local government for the sustainable provision of one or more municipal services.

Municipal Natural Asset Management

Based on the work of the Town of Gibsons, the municipal natural asset management approach adapts traditional asset management methods to the unique characteristics of nature but maintains the same goal of establishing sustainable service delivery. For example, a wetland, which may have only previously been assessed for its recreational or aesthetic value, is now also assessed for the stormwater management services it provides. These services are then valued, using a cost replacement method – how much would it cost to replace those stormwater services currently being provided by the wetland with an engineered alternative.

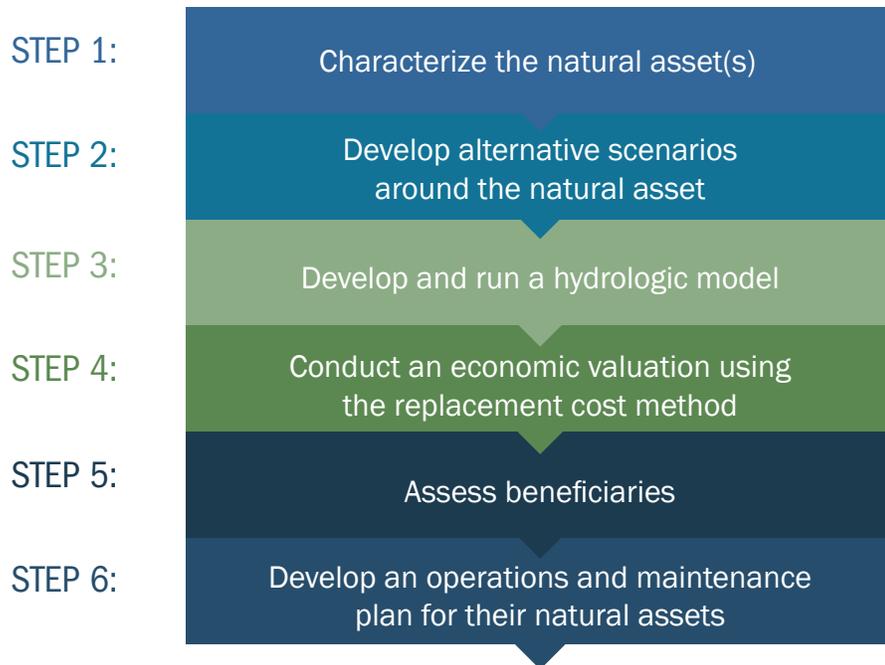


Figure 2: The 6 step municipal natural asset management methodology

At present, the municipal natural asset management methodology has only been developed for stormwater or flood mitigation services but eventually it will encompass all natural asset services.

Piloting municipal natural asset management: 5 Canadian communities

The Municipal Natural Assets Initiative (MNAI) was convened in 2016 with the goal of refining, testing, and scaling up the Gibson's approach to natural asset management. To do this, the MNAI team developed a methodology and guidance documents to help local governments identify, value and manage natural assets within traditional financial and asset management planning frameworks.



To test and refine the municipal natural asset management approach and methodology, five pilot communities were selected following a national request for proposals and interview process: The City of Nanaimo, BC, Town of Grand Forks, BC, District of West Vancouver, BC, Town of Oakville, ON, and the Region of Peel, ON. Each community selected a natural asset of interest within their jurisdiction with which to pilot municipal natural asset management, and the MNAI team worked closely with municipal staff to guide them through the methodology.

OVERALL FINDINGS

While the results from each project are unique, they all assessed the value of stormwater services provided by a natural asset under various scenarios. Consequently, some common key messages have emerged:

Natural assets can provide equivalent stormwater management services

Overall, results show that natural assets can provide the same level of stormwater management services as their engineered counterparts. All communities found that their natural asset of interest was meeting at least the 100-year flood storage requirements under current standards. The Region of Peel also assessed water quality management services of their natural assets of interest and found that four of five ecosystem types exceeded provincial requirements for total suspended solid removal.

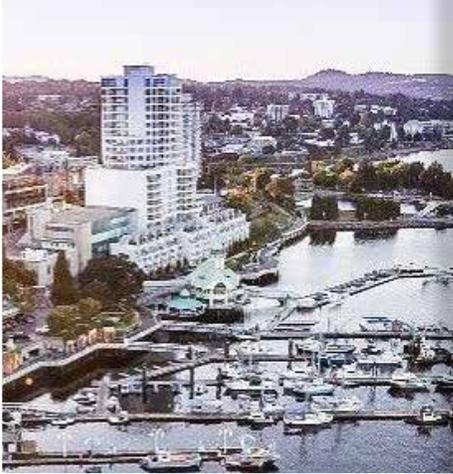
Under both climate change and intensified development scenarios, the value of natural assets increased

The City of Nanaimo, the Town of Grand Forks and the Region of Peel all assessed the value of their natural assets under climate change scenarios. All found that the value of their natural assets increased under climate change scenarios because they are more resilient and adaptable than other infrastructure solutions. The Town of Oakville assessed their natural asset under an intensified development scenario with the same result – the value of the natural asset increased because it can adapt to changing levels of development pressures.

All pilot communities found that the pilot results provide grounds for investigating the value of other natural assets

The work done by the communities in these pilot projects demonstrates the value and importance of natural assets for sustainable municipal service delivery, but there is more work to be done. Based on the initial findings, each community has expressed a stronger commitment to continue assessing the value and services provided by other natural assets.

Pilot Project Summaries



City of Nanaimo: The City of Nanaimo assessed the stormwater services being provided by the Buttertubs Marsh Conservation Area (BMCA). This is a 55 hectare (133 acre) reclaimed wetland and floodplain adjacent to the Millstone River, which flows through the centre of the city. They found that the BMCA provides significant flood attenuation services that protect some downtown neighbourhoods from flooding. The cost to replace those services with stormwater management ponds or constructed wetlands would be approximately \$4,694,295. Under climate change scenarios this replacement value increases to between \$6,559,676 and \$8,207,305.

Overall conclusion: The project demonstrated that the BMCA provides stormwater detention benefits commensurate with engineered infrastructure and that under climate change scenarios, the BMCA would provide similar levels of service despite receiving higher volumes and velocity of flows.



The City of Grand Forks: The City of Grand Forks assessed the flood mitigation benefits provided by the Kettle River Floodplain under a number of different floodplain development scenarios. The results demonstrated that the Kettle River floodplain provides – at a minimum – between \$500 and \$3,500/hectare in flood damage reduction for downtown buildings in the City of Grand Forks during high flow events.

Overall conclusion: The results provide a strong foundation for further analysis and action. The City of Grand Forks intends to incorporate the modelling information on natural floodplain function and trade-offs with development and floodplain protection options in upcoming regional floodplain mapping and hazards assessments. It will also use the information to support an update of the development permit requirements for protecting sensitive ecosystems and limiting development (including land clearing) on natural hazard lands. This will be a key part of the Official Community Plan update that will support implementation of the City's new Sensitive Ecosystem Inventory and the 2018-19 floodplain mapping and risk assessment project.



The Region of Peel: The Region of Peel assessed the stormwater quality and quantity services provided by wetlands, forests, and meadows in two sub-watersheds. They found that all wetlands, forests, and meadows assessed mitigate a 100-year flood, and all except the riverine wetlands exceed the Ministry of Environment and Climate Change's requirements for water quality. The replacement value of the stormwater services provided by these ecosystems in the two subwatersheds was estimated at roughly \$704 million under current conditions, and \$764 million under climate change conditions.

Overall conclusion: The difference in the value under existing and climate change scenarios demonstrates the ever increasing importance of natural assets in providing critical services to municipalities in the future and their important role in increasing resilience and reducing pressures on municipal infrastructure from climate change impacts.



The Town of Oakville: The Town of Oakville assessed the stormwater services being provided by the Maple Hurst Remnant Channel, a 240+ meter section of the stream located in the older part of Town which is undergoing significant redevelopment. The results demonstrated that the channel is providing equivalent stormwater services to an engineered asset and would cost between \$1.24 and \$1.44 million to replace.

Overall conclusion: The project demonstrated that the natural asset provides equivalent stormwater services compared to engineered alternatives and supports further investigation into the other remnant channels in the town. Knowledge gained through the pilot will be transferred across departments and also to the public to convey the importance of municipal natural assets, the wide variety of services they can deliver and how they can be integrated into supportive policy and on-the-ground work.



The District of West Vancouver: The District of West Vancouver assessed the construction costs of daylighting streams. Using a 90 metre covered section of a tributary to Brothers Creek as their example, they assessed the stormwater services provided and the costs associated with daylighting the stream compared to replacing it with a new culvert. They found that the total construction cost of restoration of the stream section is comparable to replacing with a new culvert. To daylight (and realign) the creek would cost \$327,200, while the cost to replace the existing underground culvert to current standards would be \$300,000.

Overall conclusion: This project demonstrated that the natural asset of interest – the covered portion of a tributary to Brothers Creek – provides stormwater management benefits commensurate with engineered infrastructure, and that the capital costs of restoring the creek to a natural state are similar to those of upgrading the culvert to meet current stormwater requirements. As a result of this project, the District of West Vancouver and MNAI have developed a Guidance Document for identifying other candidate streams for daylighting.

These first municipal natural asset management pilot projects provide evidence that natural assets are a key component of sustainable service delivery, and are cost-effective and resilient.

LESSONS LEARNED

As a first step in the process of testing the municipal natural asset management approach, each pilot project had a set of assumptions and limitations. While some are unique to each project, a few common lessons have emerged:

Data availability is important

For many pilots, the data availability and/or the ability to easily collect data within the project timeframe influenced the scope of the analysis. Where there were information gaps, assumptions within the modelling process were made, which may have impacted the overall findings. These assumptions are outlined in the Technical Reports. However, given the initial positive findings from the pilot, each community has now demonstrated that collecting additional data to support better analysis and, in turn, better natural asset management is essential for achieving fully informed financial and asset management decision-making.

The assessed values of natural assets are likely to increase once additional benefits and services are incorporated

As illustrated in Figure 1, natural assets often provide multiple services and benefits to communities. The current projects only assessed the value of the stormwater and flood mitigation services being provided by natural assets; their full value is likely to be much higher once services, such as replenishing drinking water sources, pollution removal, recreation and human health benefits are incorporated.

NEXT STEPS

To further refine the municipal natural asset management methodology, a second round of projects is already underway with the City of Courtenay, BC, the District of Sparwood, BC, the Town of Oshawa, ON, the Southeast Regional Service Commission, NB, and the Western Valley Regional Service Commission, NB. Two further initiatives, which include expanded materials on core infrastructure asset management and group training for lower capacity small/rural municipalities within one region or watershed are underway, one in British Columbia and one in the Greater Toronto Area's Greenbelt region. Finally, to continue to expand the municipal natural asset management methodology, the MNAI team is developing a methodology for assessing coastal specific services.

For each pilot community, a technical report has been published that provides a detailed summary of the project scope, methodology, results and conclusions. They are available [online \(MNAI.ca\)](https://mnai.ca).

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