

Cohort 2 National Project Summary Report

District of Sparwood, British Columbia

February 2020



Full technical report available at [MNAI.ca](https://www.mnai.ca)

Municipal Natural Assets Initiative



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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 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 Project communities.

Summarized by: Cheekwan Ho.

Reviewers: Roy Brooke and Michelle Molnar.

Funders and Supporters

The preparation of this project was carried out with assistance from the Government of Canada and the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

Additional funders for the Second National Cohort were the Infrastructure Planning Grant Program of the Province of British Columbia, the City of Courtenay, the City of Oshawa, the Town of Sparwood, the Southeast Regional Service Commission of New Brunswick, the Western Valley Regional Service Commission of New Brunswick, the Real Estate Foundation of British Columbia, and the David Suzuki Foundation (in kind).

Convening Organizations



Convening organizations: Smart Prosperity Institute, David Suzuki Foundation, Town of Gibsons, BC, and Roy Brooke and Associates were the original convening partners for the Municipal Natural Assets Initiative and the Cohort 2 project leading to this report was initiated by them.

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Summary

Communities like the District of Sparwood, B.C, recognize it is as important to understand, measure, manage and account for natural assets as it is for engineered ones. The District's Official Community Plan places a strong emphasis on protecting, enhancing and using natural assets.

The District initiated this project with the Municipal Natural Assets Initiative (MNAI) to understand how to improve water quality in the Elk River through better management of natural assets. Specifically, the Sparwood project identified a natural pond at the outlet of a culvert and explored options to manage, rehabilitate and monitor it to control erosion and reduce discharge of sediment and other effluents.

The project measured how much sediment the pond captures or would capture under four different scenarios. Results showed that an enhanced pond – now and with climate change - would capture the most sediment, around 94%.

The project also analyzed the economic costs of the existing pond, an enhanced pond, and an engineered alternative in terms of upfront or capital costs, maintenance costs, and lifecycle costs.

The results of lifecycle costing ranged from no capital or maintenance costs for the existing pond, to \$248,000 for an engineered alternative over 25 years. The District of Sparwood can now use this information in asset management decisions, both at this specific site and in other sites where the approach is replicated.

An enhanced pond – now and with climate change - would capture the most sediment, around 94%.

Introduction

The term municipal natural assets refers 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 local government services.

The District of Sparwood is located on the Elk River in southeastern British Columbia. This is a sub-basin of the Kootenay River Basin, the second largest tributary of the Columbia River watershed. Approximately 3,784 people live in Sparwood.

The community places a strong emphasis on recreation, tourism and fisheries, which have important economic benefits in the region, so they are concerned about the large stormwater flows that regularly dump sediment and other urban runoff into the Elk River, turning it brown. More frequent and intense rainfall events from climate change could increase sedimentation even further in the future.

Project

The project area was Sparwood Proper, the lower region of the District of Sparwood, an area comprised of single and multi-family residential, commercial, institutional, and light industrial uses.

The Sparwood project focused on a pond area at the storm outlet immediately downstream of the railroad. This area receives runoff from a developed subcatchment, and the pond and the adjacent forested area filter and slow the stormwater flows and capture the sediment before it flows into the Elk River.

To evaluate how well the pond captures the sediments and other solids, measured in total suspended solids (TSS), the project developed four scenarios:

1. existing pond conditions using historical rainfall data
2. existing pond conditions incorporating climate change conditions
3. an enhanced pond (by connecting it to an existing side channel) using historical rainfall data
4. an enhanced pond incorporating climate change conditions

The results indicate that the existing pond removes approximately 90.1% of TSS annually. Under a future climate change scenario, the existing pond is estimated to remove 89.8% of TSS annually. An enhanced pond now, without any allowance for climate change, would remove an estimated 94.1% of TSS annually. Under a future climate change scenario, the enhanced pond is estimated to remove 93.9% of TSS annually.

The project also measured the economics of a natural asset approach versus an engineered one. The results showed that the current pond has no capital costs and no operating and maintenance costs, even over 25 years. The enhanced pond would cost nearly \$28,000 in capital costs and more than \$2,100/year in maintenance, totalling about \$64,000

over 25 years. The engineered or grey alternative would cost more than \$200,000 in capital costs and a minimum of \$1,600/year in maintenance, totalling \$248,000 over 25 years.

This project only measured the water quality the pond area provides, and not other benefits such as improved water quality for downstream communities, improved stream health and biodiversity, and improved recreational opportunities. Such co-benefits are critical, however, and the full technical report details what the benefits are, the values, and specific recommendations on how to include co-benefits in an asset management plan.



Sediment from multiple sources reaches each outlet, diminishing water quality

The engineered or grey alternative would cost more than \$200,000 in capital costs and a minimum of \$1,600/year in maintenance, totalling \$248,000 over 25 years.

Next steps and recommendations

Currently, the District is developing a master plan for water, wastewater and stormwater management and it can leverage the data from this project for a variety of asset management purposes. The MNAI project team recommends the District replicates the project's approach in other areas of relevance, such as expanding the project to Cypress Drive.

About Municipal Natural Assets Initiative

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