

Cohort 2 National Project Summary Report

Town of Florenceville-Bristol, New Brunswick

February 2020



Municipal Natural Assets Initiative

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



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 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.

Cover Photo: MNAI

Summary

Communities like the Town of Florenceville-Bristol recognize it is as important to understand, measure, manage and account for natural assets as it is for engineered ones. The community had already taken an inventory of what traditional municipal assets they have and were ready to explore how natural assets could work alongside traditional infrastructure.

Increasingly frequent and intense rainstorms along the St. John River in the Florenceville-Bristol region of New Brunswick have caused major flooding, ongoing damage to culverts, expensive repairs, road washouts, and access issues for residents and emergency services.

The Western Valley Regional Service Commission (WVRSC), the World Wildlife Fund Canada (WWF Canada) and Florenceville-Bristol therefore partnered with the Municipal Natural Assets Initiative (MNAI) on this project to understand how proper management of natural assets – such as forests – could work alongside engineered infrastructure – such as culverts and bridges - to help manage stormwater, control erosion, and reduce or prevent flooding – all at lower cost and increased resilience to climate change.

The project developed two scenarios that examined flood and stormwater flows in two predominantly forested watersheds. The results showed that the forested regions are providing a value of \$3.5 to \$4.1 million because if those areas changed from being predominantly forest to agricultural land, that’s how much it would cost to re-create the stormwater management services to the same levels that the forests are currently providing. Developing a natural asset management plan now, however, would help protect and even enhance the stormwater service for the long term. These findings provide the basis for improved asset management in the project area and beyond.

Forested regions are providing a value of \$3.5 to \$4.1 million.

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 primary goal of the MNAI project was to understand the role natural assets play in controlling erosion and the associated implications for the maintenance of culverts and roadside ditches. The project focused on specific areas such as the boardwalk along the St. John River where ice jams and scouring cause erosion, and heavier rainfall events cause road washouts.

Project

Asset management strategies require a multi-disciplinary, team-based approach. In addition to community engagement sessions, the MNAI team modeling approach included developing a natural asset inventory, condition assessment, stormwater modelling, economic assessment, and initial planning considerations.

The project area is the predominantly forested land through the community of Florenceville-Bristol along the St. John River. Approximately 1,604 people live in that region of 182 hectares.

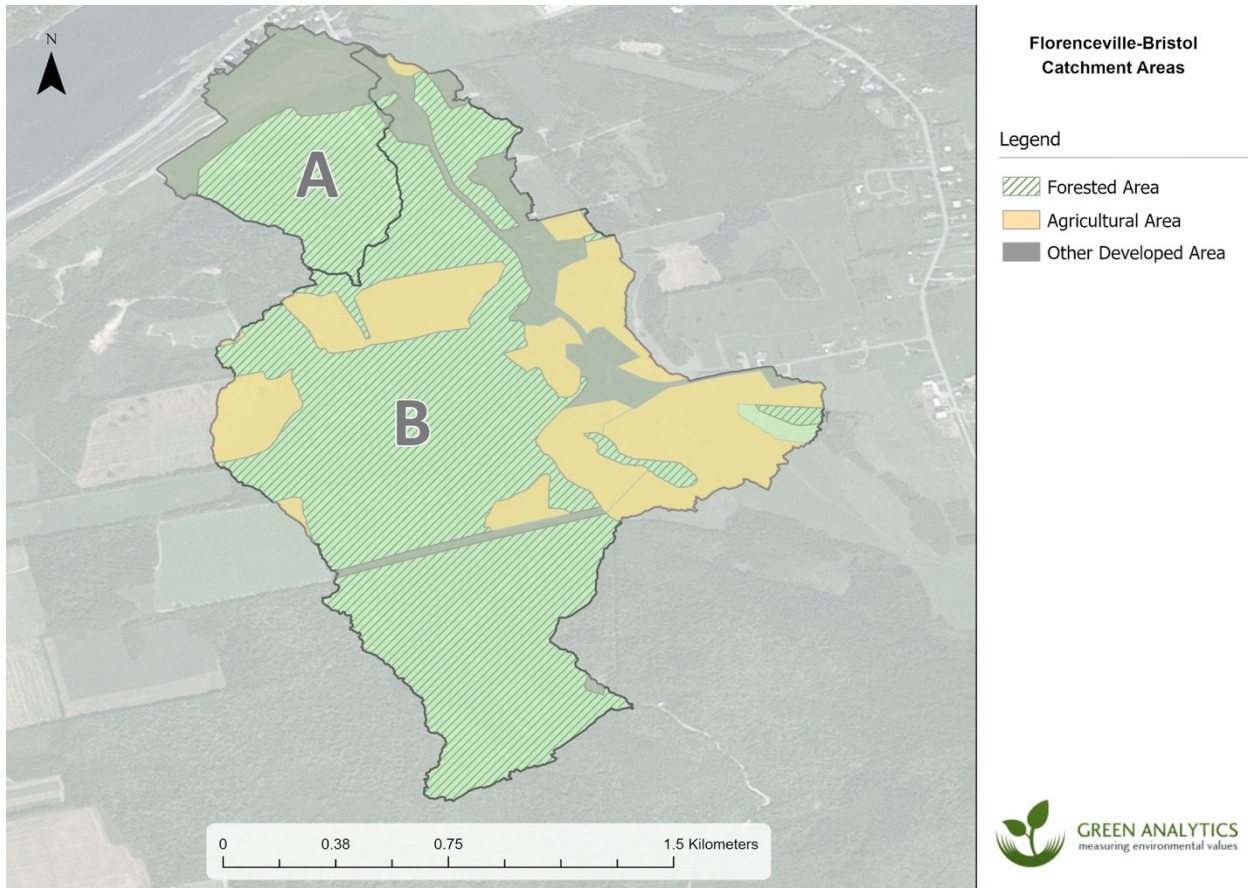


Figure 1. Forested areas provide natural protection against flooding

The project examined two scenarios that could likely happen. Scenario 1 examined the flooding that could occur in the forested region as it currently exists. Scenario 2 examined the flooding that could occur if the predominantly forested land changed to agricultural land. Both scenarios modeled results from three increasingly intense storm conditions: a 1-in-5-year storm, a 1-in-100-year storm, and a 1-in-100-year + 20% storm. This increased intensity takes climate change into consideration.

INCREASE (%) IN PEAK FLOW RATES BETWEEN SCENARIOS BY STORM			
Storm	Peak Flow (m³/s)		% Increase
	Scenario 1	Scenario 2	
1:5 Year	1.85	3.59	94
1:100 Year	5.23	8.64	65
1:100 Year + 20%	7.49	11.88	59

A loss of forests leads to a significant increase in peak water flows

The project also examined how much it would cost to replace the forests with built, engineered, stormwater management ponds.

SUMMARY OF REPLACEMENT COST		
Storm	Storage Volume Required to Offset Change in Peak Flows (m³)	Replacement Cost (\$ millions)
1:100 Year	19,991	3.50
1:100 Year + 20%	23,296	4.08
Difference	3,305	0.58

Replacing the forests with grey infrastructure would cost \$3.5M - \$4.1M

The project results show the cost of replacing the forest cover with engineered alternative(s) that provide the same level of service would cost \$3.5 million. If climate change increases the intensity of rainfall for a 1:100 year event by 20%, the value of the forests’ services increases by \$600,000 to \$4.1 million.

This project only measured the benefits the forested lands provide for stormwater management and not for other benefits that forests provide, such as access to green and recreational space for residents, social and physical wellbeing, wildlife habitat, biodiversity, water quality, and protection from climate change. 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.

Next steps and recommendations

Currently, operation and management plans have not been developed for the forests of the project area. The modeling work from this project demonstrates how appropriate management of the watersheds would help them continue to manage storm water, avoid further issues of erosion, and ease pressure on ditches and culverts.

The MNAI project team recommends several next steps, which the Town has accepted:

- develop a natural asset management policy: this would outline and describe the principles the local government would follow when implementing their asset management practices to provide sustainable, fiscally responsible service delivery to residents.
- document the lifecycle costs of natural versus engineered assets: start-up, operating, maintenance, and end-of-life costs for natural assets may be lower or non-existent, or they can even appreciate in value.
- consider adapting bylaws for future developments: to recognize and protect natural infrastructure that's already providing a service.

Appropriate management of the watersheds would help them continue to manage storm water.

About 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.

This study was completed in partnership with Western Valley Regional Service Commission (WVRSC) and World Wildlife Fund Canada (WWF Canada).