

GETTING NATURE ON THE BALANCE SHEET: RECOGNIZING THE FINANCIAL VALUE PROVIDED BY NATURAL ASSETS IN A CHANGING CLIMATE

Supported by:



Joanna Eyquem
Bailey Church
Roy Brooke
Michelle Molnar

About the Intact Centre on Climate Adaptation

The Intact Centre on Climate Adaptation (Intact Centre) is an applied research centre at the University of Waterloo. The Intact Centre was founded in 2015 with a gift from Intact Financial Corporation, Canada's largest property and casualty insurer. The Intact Centre helps homeowners, communities and businesses to reduce risks associated with climate change and extreme weather events.

For additional information, visit: www.intactcentreclimateadaptation.ca

About the University of Waterloo

The University of Waterloo is Canada's top innovation university. With more than 42,000 full and part-time students (Fall 2020), the university is home to the world's largest co-operative education system of its kind. The university's unmatched entrepreneurial culture, combined with an intensive focus on research, powers one of the top innovation hubs in the world.

For additional information, visit: www.uwaterloo.ca

About KPMG

KPMG is a global organization of professional services firms providing audit, tax and advisory services in 144 countries and territories. KPMG LLP is an Ontario-headquartered limited liability partnership and a member firm affiliated with KPMG International Limited, a private English company limited by guarantee. The firm has roots in Canada that date back to 1869 and operates from more than 40 locations across the country.

For additional information, visit: www.home.kpmg/ca/en

About MNAI

The Municipal Natural Assets Initiative (MNAI) is a Canadian not-for-profit that 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.

For additional information, visit: www.mnai.ca

About the Intact Financial Corporation

Intact Financial Corporation (TSX: IFC) is the largest provider of property and casualty (P&C) insurance in Canada, a leading provider of global specialty insurance, and, with RSA, a leader in the U.K. and Ireland. Our business has grown organically and through acquisitions to over \$20 billion of total annual premiums. In Canada, Intact distributes insurance under the Intact Insurance brand through a wide network of brokers, including its wholly-owned subsidiary BrokerLink, and directly to consumers through belairdirect. Intact also provides affinity insurance solutions through the Johnson Affinity Groups. In the U.S., Intact Insurance Specialty Solutions provides

a range of specialty insurance products and services through independent agencies, regional and national brokers, and wholesalers and managing general agencies. Outside of North America, the Company provides personal, commercial and specialty insurance solutions across the U.K., Ireland, and Europe through the RSA brands.

For additional information, visit: <https://intactfc.com/>

Citation

Eyquem, J. L., Church, B. Brooke, R and Molnar, M. 2022. Getting Nature on the Balance Sheet: Recognizing the Financial Value of Natural Assets in a Changing Climate. Intact Centre on Climate Adaptation, University of Waterloo.

For information about this report, contact Joanna Eyquem: joanna.eyquem@uwaterloo.ca

Disclaimer

The information stated in this report has, to the best of our knowledge, been collected and verified as much as possible. The Intact Centre cannot make any guarantees of any kind, as to the completeness, accuracy, suitability or reliability of the data provided in the report. This report has been prepared for general guidance on matters of interest only and does not constitute professional advice. You should not act upon the information contained in this publication without obtaining specific professional advice. No representation or warranty (express or implied) is given as to the accuracy or completeness of the information contained in this publication, and Intact Centre employees and affiliates do not accept or assume any liability, responsibility, or duty of care for any consequences to you or anyone else acting, or refraining to act, in reliance on the information contained in this report or for any decision based upon it.

Table of Contents

Acknowledgements	5
Executive Summary	8
1. Introduction to Natural Assets	11
1.1 Natural Assets in Canada	14
1.2 A Valuable Ally in Tackling Climate Change	15
1.3 Natural Assets and Financial Disclosures	16
2. Inventory and Valuation of Municipal Natural Assets in Canada	17
2.1 Overview of Progress to Date	17
2.2 Illustrative Case Studies	20
3. Methods of Valuing Natural Assets	22
4. Evolution of International Approaches	25
5. Progress and Next Steps	28
Appendix A	30
Endnotes	37

Acknowledgements

The authors thank the stakeholders listed below, and Natalia Moudrak for supporting the ability to recognise non-purchased natural assets in public sector financial statements. A letter, jointly signed by those listed below, was formally submitted to the Public Sector Accounting Board in June 2021 in response to the consultation on drafts “The Conceptual Framework for Financial Reporting in the Public Sector” and “Financial Statement Presentation, Proposed Section PS 1202” ([see Appendix A](#)). The content of this report draws on, and updates, [supporting information](#) originally prepared and jointly submitted under separate cover by the Intact Centre on Climate Adaptation, KPMG and the Municipal Natural Assets Initiative as part of the same consultation.

Julia Aspinall, CPA, CMA, Director, Financial Services, City of Vancouver

Jeff Atherton, P.Eng., Senior Asset Management Consultant, AECOM Canada Ltd

Hassaan Bassit, President and CEO, Conservation Halton

Sonia Baxendale, President and CEO, Global Risk Institute

Al Beaver, Executive Director, Wildland Fire Risk Management Ltd

Susan Black, Ph.D., President and CEO, The Conference Board of Canada

Jerry Blackwood, CPA, CGA, Executive Director, CFO Finance and Asset Management, Halifax Regional Municipality

DG Blair, Executive Director, Stewardship Centre for BC

Alain Bourque, Executive Director, Ouranos - Consortium sur les changements climatiques

Sandra Califaretti, CPA, CA, Director, Accounting Services, City of Toronto

Christopher Chen, CPA, Executive Director, Asset Management Ontario

Will Cole-Hamilton, Steering Committee, Climate Caucus (300+ elected officials)

Michael Coroneos, CPA, CMA, Deputy City Manager, CFO and Treasurer, City of Vaughan

Jennifer Court, (former) Executive Director, Green Infrastructure Ontario

Laura Cui, CPA, CGA, National Director of Finance, Canadian Parks and Wilderness Society (CPAWS)

Raoul Cyr, CPA, CA, Director, Accounting and Financial Information, City of Montreal

Jérôme Dupras, Ph.D., Associate Professor, Canada Research Chair in Ecological Economics, University of Quebec in Outaouais

Lara Ellis, Senior Vice-President, Policy and Partnerships, ALUS

Blair Feltmate, Ph.D., Head, Intact Centre on Climate Adaptation, University of Waterloo

Richard Florizone, Ph.D., President & CEO, International Institute for Sustainable Development

Myriah Foort, BBA, CPA, CA, CFO, Comox Valley Regional District

Daisy Foster, Managing Director, Atlantic Infrastructure Management (AIM) Network

Jonathan Fowlie, Chief External Relations Officer, Vancouver City Savings Credit Union

Kim Gavine, General Manager, Conservation Ontario

Julie Gelfand, (former) Federal Commissioner of Environment and Sustainable Development, Office of the Auditor General of Canada

Isabel Gordon, CPA, MBA, Director, Financial Services, District of West Vancouver

Deborah Harford, (former) Executive Director, Adaptation to Climate Change Team, Simon Fraser University

Lisa Helps, Mayor, City of Victoria

Jenn Hepting, CFO and Director of Finance, City of Colwood

Michel Houle, CPA, CMA, (former) VP, Corporate Services and CFO, National Capital Commission

Dan Huang, RPP, MCIP, President, Canadian Institute of Planners

Jeffrey J. Jackson, CPA, CA, MBA, Director of Finance and Treasurer, City of Mississauga

Gabriella Kalapos, Executive Director, Clean Air Partnership

Sean Kidney, CEO, Climate Bonds Initiative

Saul Klein, Ph.D, Dean, Gustavson School of Business, University of Victoria

Catherine Lavoie, President and CEO, Centre d'expertise et de recherche en infrastructures urbaines (CERIU)

Michael Leering P.Eng., Director, Environment and Business Excellence Standards, CSA Group

Moya J. Leighton CPA, CGA, MBA, Town Treasurer & Director of Finance, Town of Halton Hills

Meghan Leslie, President and CEO, WWF-Canada

Emanuel Machado, Chief Resiliency Officer, Town of Gibsons

Deborah Martin-Downs, (former) CAO, Credit Valley Conservation

Gerard McDonald, MBA, P.Eng., ICD.D, CEO, Engineers Canada

Edward McDonnell, CEO, Greenbelt Foundation

Mark Medeiros, Director of Finance / City Treasurer (acting), City of Brampton

Susan Nesbitt, Ph.D. P.Eng., Professor, Co-Director, Urban Systems Master of Engineering Leadership, The University of British Columbia

Bernadette O'Connor, Manager, Municipal Asset Management, Canada, WSP Canada Inc.

Sarah Pacey, Chief Administrative Officer, Town of Florenceville-Bristol

Jennifer Petruniak, PMP, Technical Lead, Environmental Services, Dillon Consulting

Jennifer Place, Board Chair, Government Finance Officer of Alberta (GFOA)

Jay Ritchlin, Director-General, Western Canada/National Nature portfolio lead, David Suzuki Foundation

Florian Roulle, Senior Director, Head of Sustainable Finance, Finance Montreal

Carole Saab, CEO, Federation of Canadian Municipalities

Rachel Samson, (former) Clean Growth Research Director, Canadian Institute for Climate Choices

Ron Scheckenberger, P.Eng., Principal, Wood Canada Ltd

Robert Siddall, FCPA, FCA, Independent

Colleen Sklar, Executive Director, Winnipeg Metropolitan Region

Robert Smith, Principal, Midsummer Analytics

Craig Stewart, Vice President, Federal Affairs Insurance Bureau of Canada

Marcy Sullivan, CPA, CA, CFO, Ducks Unlimited Canada

Kevin Travers, Partner, Infrastructure Government and Healthcare Practice, KPMG Canada

Martin Vaillancourt, Executive Director, Regroupement national des conseils régionaux de l'environnement du Québec

Antoine Verville, (former) Executive Director, Regroupement des organismes de bassins versants du Québec

Andrea Waldie, P.Geo., FGC, CEO, Geoscientists Canada

Andy Wardell, CPA, CGA, General Manager, Finance and CFO, District of North Vancouver

Wally Wells, P.Eng., Executive Director, Asset Management BC

Kevin Wilkinson, CPA, CA, MBA, Controller, Windsor-Detroit Bridge Authority

Mike Wilson, Executive Director, Smart Prosperity Institute

Robert Wilson, Director of Conservation Finance, Nature Conservancy of Canada

“Wetlands, forests, saltmarshes and grasslands aren’t only vital to biodiversity. They are our front-line allies in reducing the impacts of flooding and erosion, extreme heat and drought, as well as removing carbon emissions to slow down climate change. The value of these services makes nature a sound economic driver - we need an accounting system that recognises this reality.”



Mike Pedersen, Chair, Business Development Bank of Canada (BDC),
Corporate Director, and Chair, Nature Conservancy of Canada.

Executive Summary

Nature is valuable and underpins our economy. While governments and businesses may agree in principle with this statement, the services that nature provides are not routinely accounted for in investment decisions, asset management or accounting. As a result, decisions may not be economically-sound in the long-term. Decisions may also lead to continued degradation of the services that nature provides, rather than the accelerated investment in natural-climate solutions that is needed.



Nature has a particular role to play in tackling climate change, where it serves “double-duty” - by building community resilience (for example, by acting like a sponge during major rainfall events) and by reducing greenhouse gases in the atmosphere (through storing and sequestering carbon). Preservation of nature is an important first step. Tackling climate change and reversing biodiversity loss will also require investment in nature-positive actions that restore and enhance natural assets.

The good news is that, in Canada, many local governments are already identifying and pro-actively managing their natural assets. Several local

governments have also assessed the economic value of services from these assets and are ready to make related disclosures in their financial statements.

In parallel, the rise of sustainable finance and use of Environmental, Social, Governance (ESG) performance ratings in the financial sector has also placed increased emphasis on private investment in natural assets (also termed natural capital). Further, the Taskforce on Nature-related Financial Disclosures (TNFD) framework provides a template for disclosing nature-related risks and opportunities that specifically recognizes the positive benefits of natural-climate solutions.



Nature-based solutions

Actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.¹

Natural-climate solutions

A subset of nature-based solutions, natural-climate solutions include conservation, restoration, and improved land and sea management that increase carbon storage and/or avoid greenhouse gas emissions, enhance resilience and assist climate adaptation across global forests, wetlands, mangroves, grasslands, and agricultural lands and other habitats.^{2,3}

A key challenge in Canada is mainstreaming recognition of the role and value of natural assets within a timeframe that supports accelerated investment in natural-climate solutions. This discussion paper provides an overview of progress to date, with specific focus on public sector accounting, reporting and decision-making, and concludes by recommending three avenues for short-term focus:

1. **Reverse Natural Asset Accounting**

Exclusions: Remove the explicit exclusion of natural assets from public sector financial statements, understanding that this does not obligate public-sector entities to include natural resources in their financial position statements (action led by Public Sector Accounting Board).

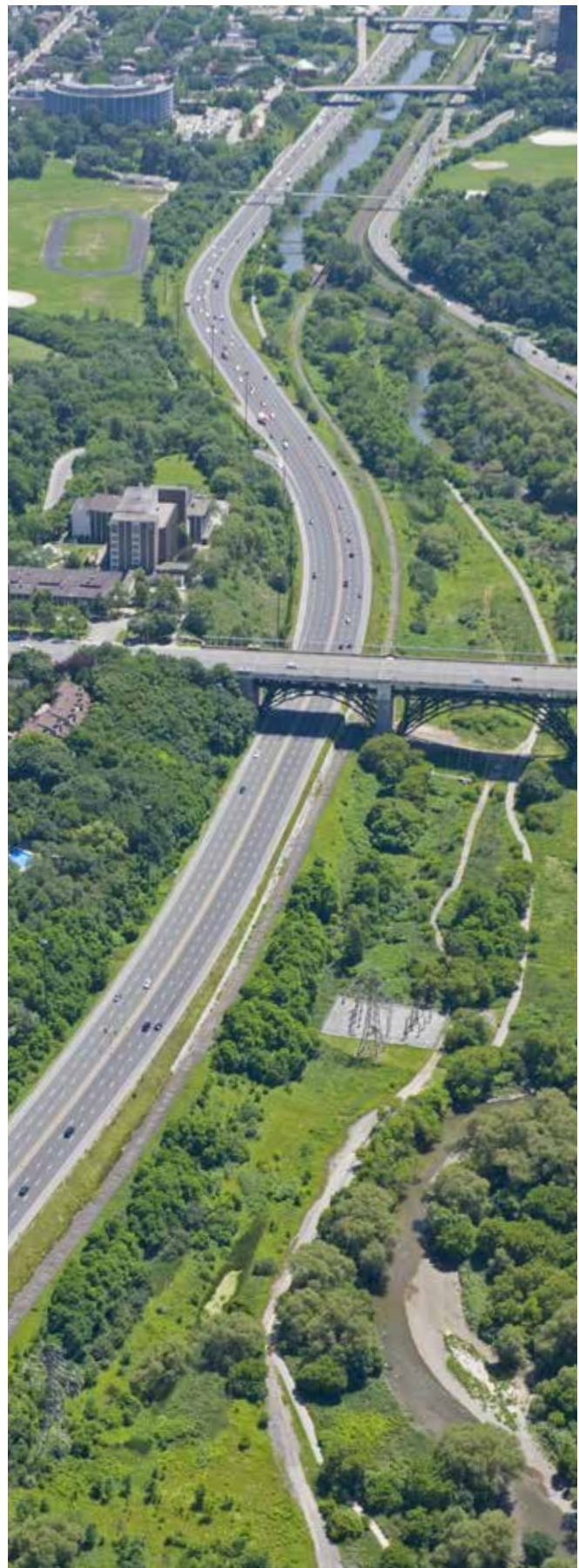
2. **Establish National Natural Asset**

Guidelines and Standards: Establish practical guidelines and national standards for inventory, management, and valuation of local government natural assets. The current development of a national standard for natural asset inventory is the first step in this process (action led by Standards Council of Canada, CSA Group, other standards setters).

3. **Engage Financial Institutions in Nature-**

Positive Action: Engage Canadian financial institutions and organizations in testing and refining the draft TNFD framework and making investments that build natural capital. This includes both making investments that “do no harm” as well as actively investing in solutions that enhance and restore nature and the ecosystem services provided to people (action led by Sustainable Finance Action Council).

These actions will help Canada enlist and work with nature to slow climate change, increase climate resilience and reverse biodiversity loss, ultimately benefiting the wellbeing of people in Canada and beyond.



1. Introduction to Natural Assets

The term “natural assets” refers to the stock of natural resources and ecosystems.⁴ Examples of natural assets include:



wetlands



rivers



lakes



forests



fields



coastal
marshes



dunes



soils

Benefits that people obtain from natural assets are termed **ecosystem goods and services**, and may be divided into provisioning, regulation and maintenance, and cultural services as described below:⁵

- **Provisioning services** are the products obtained from ecosystems, including, for example, food, wood, and fresh water.
- **Regulation and maintenance services** are services that regulate ecosystem processes and support the production of other ecosystem services, including, for example climate regulation and water cycling.
- **Cultural services** include spiritual, recreational, and cultural benefits that people obtain from nature, including for example, aesthetic enjoyment, and physical and mental health benefits.

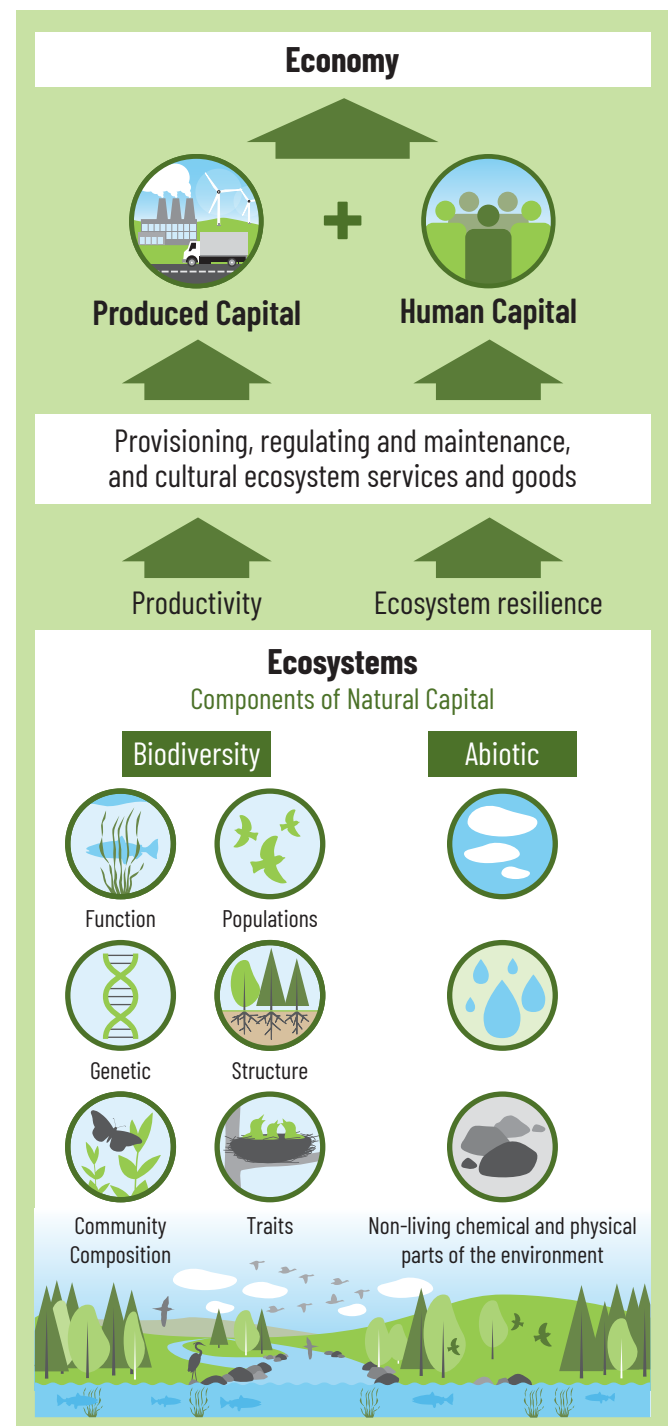
These are all services provided by nature that ultimately benefit people.

Economists often refer to natural assets as “natural capital”. The role of ecosystems and the services they provide, in underpinning all economic activity, has been amply documented nationally and internationally. In the landmark report produced for the U.K. government, “The Economics of Biodiversity: The Dasgupta Review”, the role of natural capital in supporting both human capital (reflecting the value of people and society) and produced capital (financial and manufactured outputs) was clearly illustrated (Fig. 1).⁶

It is notable that both biodiversity and abiotic (non-living) components of ecosystems are highlighted as important. The World Economic Forum’s New Nature Economy series identified that, “US\$44 trillion of economic output— more than half the world’s Gross Domestic Product (GDP) - is moderately or highly dependent on nature and its services.”⁷ The need for

increased focus on a “nature-positive” economy, was also a key topic of discussion at the Forum’s 2022 meeting of world leaders in Davos, Switzerland.⁸ Canada has already committed to reversing biodiversity loss by 2030.⁹

Figure 1: Links From Biodiversity to the Economy (adapted from Dasgupta, 2021)





Nature is clearly key to tackling the dual crises of climate change and biodiversity loss. There is therefore an increasingly urgent need to overcome the institutional, economic and accounting failures to recognize nature and its value.

This paper starts out by outlining actions that are already being taken to actively manage natural assets in Canada (Section 2) alongside established methods of valuing the services they provide (Section 3). An overview is subsequently provided of the evolution of international approaches (Section 4) and steps that can be taken to recognise and value the services provided by nature in public and private sector accounting and decision-making (Section 5).

1.1 Natural Assets in Canada

The role played by natural assets in delivering services to people is becoming more recognized and valued in Canada. At the local level, action is being taken by a growing number of local governments to manage natural assets, since many ecosystem services either contribute directly to local government services (e.g., to provide stormwater conveyance, erosion control, air quality) or are strongly influenced by local decision-making (e.g., about community well-being). However, overall, natural assets are not routinely inventoried, the services they provide are not valued, and non-purchased natural assets are explicitly excluded in public-sector financial reporting.

The lack of management and disclosure of the value of Canada's natural assets values in Canada is one issue that has historically led to their mismanagement and to the degradation of the services they provide to public-sector entities. Associated consequences and risks include:

- **Ill-informed decision-making:**

Since the value of intact natural assets is excluded from public-sector entity financial statements, the costs of damage to natural infrastructure or the benefits of restoration are not appropriately factored into economic decision-making. Consequently, short-term monetary gains that often drive the

degradation of natural assets are frequently prioritized above the long-term economic value of services provided year-on-year by intact natural assets.

- **Unknown or undocumented liabilities:**

Degraded natural assets may present otherwise undocumented liabilities. For example, a degraded aquifer can lead to substantial costs to find or build a suitable alternative water source. A local government that does not understand the extent to which it relies on natural assets for core services is also likely to be conveying an incomplete picture of potential liabilities in annual financial reports.

- **Inappropriate representation of natural assets as an overall cost:**

Whereas the costs of managing and maintaining natural assets are included in financial reports, the value of services derived from these assets is currently excluded. Financial reports will therefore typically misrepresent the contribution of natural assets to the overall public sector entity budget. This may disadvantage the borrowing ability of public sector entities who are proactively managing their natural assets.

- **Difficulty securing private investment in nature-based solutions:** The exclusion of natural assets from public sector financial reporting makes it difficult to demonstrate the financial return on investment in nature-based solutions. This is a key problem in view of the needs identified by the United Nations Environment Programme to a) close a 4.1 trillion USD financing gap in nature by 2050 and b) up-scale the role of private finance (which accounted for only 14% of investment in nature-based solutions in 2021).¹⁰

- **Lack of incentive to manage natural assets:** The inability to reflect the value of natural assets in financial statements may discourage many public sector entities from proactively identifying and managing natural assets.

1.2 A Valuable Ally in Tackling Climate Change

Natural assets bring direct financial benefits to public sector entities, including those associated with addressing climate change and biodiversity – two heavily intertwined global crises.

The effective management of natural assets by public-sector entities can contribute two-fold to addressing climate change by: a) contributing to reduction of climate-related risks (climate adaptation) and b) by increasing carbon sequestration thereby reducing

greenhouse gases (GHG) in the atmosphere (climate mitigation). These specific ecosystem services, as well as the value of biodiversity, are incorporated in the overall value of natural capital.

The significant financial value of natural assets in reducing the damages from flooding was highlighted in a framework established in 2016 by the Insurance Bureau of Canada, the International Institute for Sustainable Development and the Intact Centre on Climate Adaptation.¹¹ Natural assets also play an important role in reducing the impact of extreme heat created by the “urban heat island effect;” and several major cities are increasing their tree canopy on a large scale to counteract such heat.¹²

On the climate mitigation side, natural assets are key in carbon storage and sequestration. Vegetation extracts carbon from the atmosphere, while the Earth’s soils hold



about 2,500 gigatons of carbon— more than three times the amount of carbon in the atmosphere and four times the amount stored in all living plants and animals.¹³ According to the Geological Survey of Canada, the peat in Canada’s wetlands holds almost 60 per cent of all the carbon stored in soils across the country.¹⁴ As part of Canada’s Emissions Reduction Plan, the federal government announced investment of an additional \$780 million in the Nature Smart Climate Solutions Fund in 2022, in addition to the \$4 billion already allocated, to deliver additional emission reductions.¹⁵

Carbon storage and sequestration is receiving increasing attention as countries and businesses have adopted “net-zero” targets, and look to nature-based solutions as a means to offset greenhouse gas emissions. GHG offset credits can also be used to reduce amounts owed under Canada’s carbon pricing system. Although specific arrangements exist in different provinces, they must meet the minimum federal standard, which include a performance-based system for industries, known as the Output-Based Pricing System, as well as a regulatory fuel charge.¹⁶ GHG offset credits are likely to appreciate in value driven by increased demand, although their pricing within the carbon market will likely not reflect the full range of services provided by natural assets. Public sector entities could potentially play a role in generating credits under the Greenhouse Gas (GHG) Offset Credit System if they register and implement projects that reduce GHGs using a published federal GHG offset protocol.¹⁷

1.3 Natural Assets and Financial Disclosures

Natural assets can help manage both climate and nature-related risks and opportunities, for which different frameworks for financial disclosures have been developed.

In relation to climate, Canada’s Budget 2021 stated that, “... to ensure a stable and predictable transition to a low-carbon economy, markets, insurers, policy makers, and the public require standardized information about the climate-related risks and opportunities organizations face.”¹⁸ Crown corporations are required to meet milestones for climate-related financial disclosures by 2022 or 2024, depending on the value of assets held. Disclosures are to follow the Task Force on Climate-related Financial Disclosures (TCFD) standards, or “more rigorous, acceptable standards ... applicable to the public sector at time of disclosure”.¹⁹ According to Budget 2022, federally regulated financial institutions will also be required to publish climate disclosures— aligned with the TCFD framework - using a phased approach, starting in 2024.²⁰ It is also notable that the cities of Toronto, Montreal, and Vancouver have also been reporting on their climate-related risks and opportunities under the TCFD framework since 2019 and contributed to CPA published guidance to help other cities do the same.²¹

In relation to nature, the Task Force for Nature-Related Financial Disclosures (TNFD) was established in September 2020, and in April 2022 launched its “beta” framework for pilot testing and review.²² The beta framework includes specific mention of natural climate solutions as an opportunity to enhance natural resilience.²³ The Government of Canada is part of the TNFD Forum²⁴ and, as part of the G7, recently committed, “to increase and improve our climate finance contributions through to 2025, including increasing adaptation finance and finance for nature-based solutions.”²⁵

2. Inventory and Valuation of Municipal Natural Assets in Canada



2.1 Overview of Progress to Date

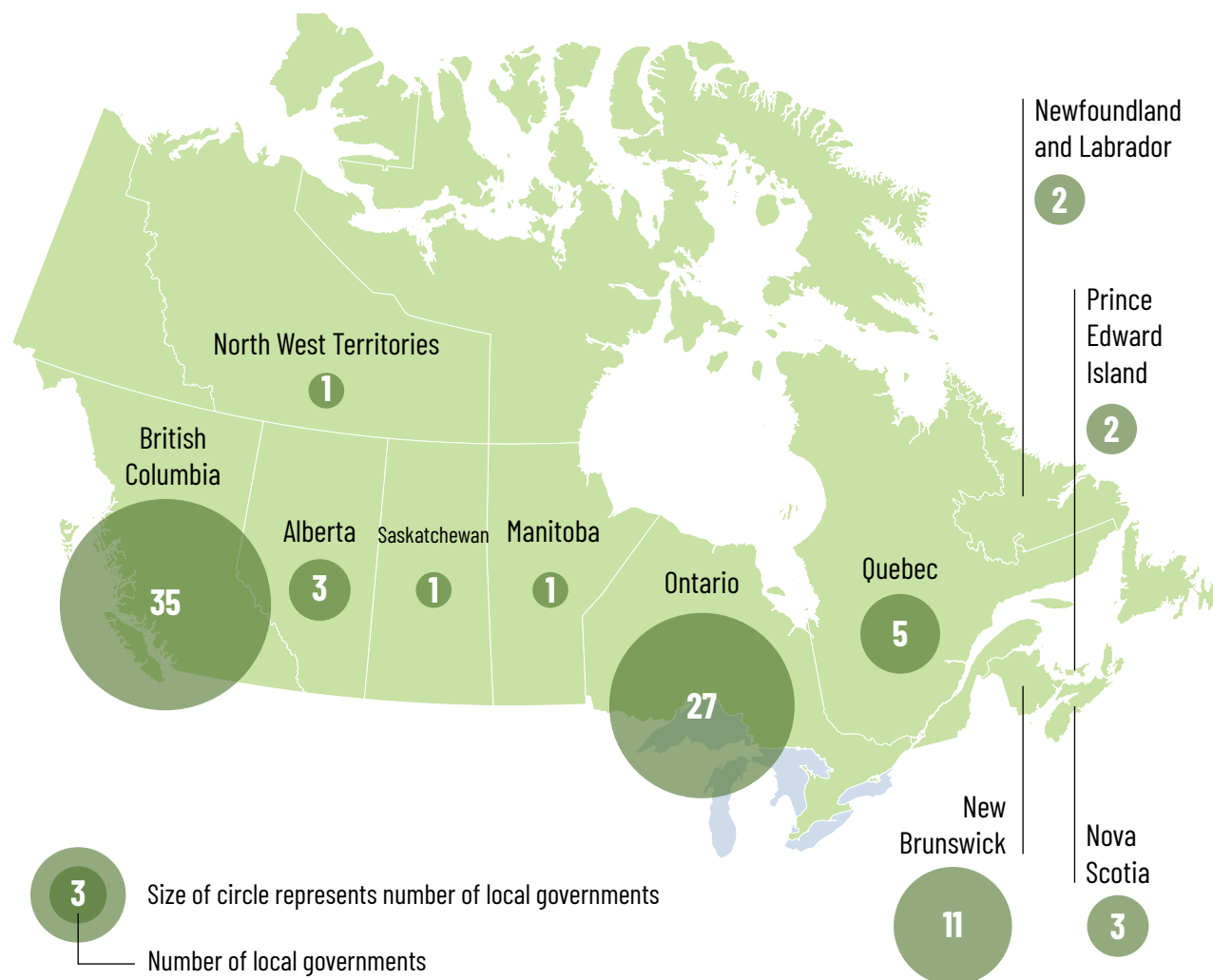
Since 2016, local governments across Canada have been undertaking asset management-based approaches that recognize natural assets as infrastructure to be protected and managed for the long-term. This includes conducting inventories, modeling, valuing and managing natural assets (Figure 2, Table 1), and the rate of such activities is increasing.

Several organizations are currently working together to develop a new national standard for Canada for the inventory of natural assets – the first step in managing and valuing these assets.

The value of the services provided by natural assets has been calculated in economic terms through the work of the Municipal Natural Assets Initiative

(MNAI), the Greenbelt Foundation, the Toronto Region Conservation Authority (TRCA), Credit Valley Conservation (CVC), Ouranos, the University of Quebec in Outaouais (Research Chair in Ecological Economics), the International Institute of Sustainable Development, the Insurance Bureau of Canada, the Intact Centre on Climate Adaptation, and ALUS, among others.

Figure 2: Local governments across Canada where natural asset management efforts, including inventory, modelling, valuation and management, have already been undertaken.



N.B. This is not an exhaustive inventory and is designed to illustrate progress rather than documenting all activity.

Table 1: Local governments across Canada where natural asset management efforts, including inventory, modelling, valuation and management, have already been undertaken (this list is not exhaustive).

British Columbia	35. Village of Cumberland	65. Town of Lincoln
1. City of Abbotsford	North West Territories	66. Town of Newmarket
2. City of Campbell River	36. City of Yellowknife	67. Town of Oakville
3. City of Colwood	Alberta	68. Town of The Blue Mountains
4. City of Courtenay	37. City of Calgary	Quebec
5. City of Cranbrook	38. City of Edmonton	69. National Capital Region (Ottawa/Gatineau)
6. City of Dawson Creek	39. Town of Okotoks	70. Montreal Metropolitan Community
7. City of Grand Forks	Saskatchewan	71. Quebec Metropolitan Community
8. City of Kelowna	40. City of Saskatoon	72. Municipality of Compton
9. City of New Westminster	Manitoba	73. Watershed of the Rivière Chaudière
10. City of Port Coquitlam	41. Winnipeg Metropolitan Region	New Brunswick
11. City of Prince George	Ontario	74. City of Edmundston
12. City of Rossland	42. City of Brantford	75. City of Fredericton
13. City of Surrey	43. City of Burlington	76. City of Moncton
14. City of Vancouver	44. City of Hamilton	77. Northwest Regional Service Commission
15. City of West Kelowna	45. City of London	78. Point-du-Chêne
16. District of Kent	46. City of Markham	79. Town of Florenceville-Bristol
17. District of Mackenzie	47. City of Mississauga	80. Town of Riverview
18. District of Saanich	48. City of Orillia	81. Town of Sackville
19. District of Sparwood	49. City of Oshawa	82. Town of Saint Andre
20. District of Vanderhoof	50. City of Ottawa	83. Village of Drummond
21. District of West Vancouver	51. City of Peterborough	84. Village of Riverside-Albert
22. Regional District of Alberni-Clayoquot	52. City of Richmond Hill	Nova Scotia
23. Regional District of Comox Valley	53. City of St. Catharine	85. District of Lunenburg
24. Regional District of Central Kootenay	54. City of Vaughan	86. Halifax Regional Municipality
25. Regional District of Central Okanagan	55. City of Windsor	87. Town of New Glasgow
26. Regional District of East Kootenay	56. County of Dufferin	Prince Edward Island
27. Regional District of Kootenay Boundary	57. County of Northumberland	88. City of Charlottetown
28. Regional District of Nanaimo	58. Municipality of Port Hope	89. Town of Stratford
29. Regional District of Squamish-Lillooet	59. National Capital Region (Ottawa / Gatineau)	Newfoundland and Labrador
30. Resort Municipality of Whistler	60. Region of Peel	90. City of St. John's
31. Town of Comox	61. Region of Niagara	91. Town of Logy Bay-Middle Cove-Outer-Cove
32. Town of Gibsons	62. Region of York	
33. Town of Golden	63. Tay Valley Township	
34. Township of Langley	64. Town of Halton Hills	

2.2 Illustrative Case Studies

The examples below illustrate the **significance of natural assets for stormwater management and flood resilience**, based on MNAI's assessments²⁶, which use the same detailed modeling as for many engineered assets:



\$18.9
MILLION

- A seven-kilometre riverbank in the Oshawa Creek watershed in Ontario provides \$18.9-million worth of stormwater conveyance/drainage annually to nearby communities based on replacement cost;



\$3.5-4
MILLION

- Naturally occurring ponds in White Tower Park in Gibsons, B.C. provide between \$3.5-million and \$4-million in stormwater storage to the local government based on replacement cost;



\$2.4
MILLION

- Widening and naturalizing 1,292 metres of the Courtenay River riverbank in Courtenay, B.C. provides \$2.4-million in flood-damage reduction to downstream properties during a 1-in-200-year flood event; and



\$1.4
MILLION

- Protecting four wetlands that comprise 13 791 square metres in the Mill Creek Watershed in New Brunswick delivers \$1.4-million in benefits during a 1-in-100 year flood event.

The findings of numerous other organizations in Canada similarly document the significant monetary value of natural assets for flood-risk reduction and other services:



\$49.8
MILLION

- The ability of wetlands to slow down, store and enable the evaporation of excess rainwater helps to reduce flood damages in the metropolitan area of Quebec City, a service worth \$49.8-million annually.²⁷



\$5.5
MILLION

- In the National Capital Region, which contains the cities of Ottawa, Ont. and Gatineau, Que., urban and rural forests provide erosion control services worth an estimated \$327,500 and \$5.2-million annually, respectively.²⁸



\$44.2
MILLION

- In the City of Hamilton, a restored wetland complex costing approximately \$15.3-million (compared with \$28.5-million for an engineered solution) will reduce floods and provide recreation and other services valued at up to \$44.2-million.²⁹



In relation specifically to climate regulation through carbon storage and sequestration:



\$16.3
BILLION

- Within the metropolitan area of Quebec City, rural and urban forests have been estimated to provide carbon storage services to a value of \$11.59 billion (total), and carbon sequestration services of \$9.3 million (per year). Wetlands have been estimated to provide carbon storage services to a value of \$4.67 billion (total), and carbon sequestration services of \$0.9 million (per year).³⁰



\$2.9
MILLION

- Wetlands within the National Capital Region were estimated to provide climate regulation services to a value of \$2.9 million per year.³¹

3. Methods of Valuing Natural Assets

The exclusion of natural assets within public accounting rests in part on an argument that their value cannot be reliably determined. However, this understanding is outdated, given the availability of methods of valuing natural assets, and their active use by local governments in Canada.



The extent of the services provided by natural assets can be identified using a combination of modeling and monitoring. Their value can then be determined by applying well-defined economic approaches.

Natural assets that have not been purchased may be valued using several well-developed techniques, grouped into three approaches: 1) direct market valuation, 2) revealed preference and 3) stated preference. A fourth category, the benefit-transfer (or value-transfer) method, involves applying the results from prior studies of a specific ecosystem service to a new area of interest. Each of these methods has its strengths and weaknesses, and most can only be applied to a subset of ecosystem services.

A frequently recommended method for assessing the value of natural assets is the **Replacement Cost** method. This employs a direct market valuation and can be readily calculated. It shows what it would cost to replace or substitute a natural asset's service (in this case, by an engineered means). This valuation method is appropriate when the services being provided by a natural asset could be replaced by conventional infrastructure (e.g., engineered stormwater management). In this case, the cost of replacing the asset's capacity to provide a specific service can be estimated using the replacement cost of conventional infrastructure.

Revealed Preference may be an appropriate method when a local government would like to understand how a natural asset is affecting the market price of a related good (e.g., the travel cost incurred to visit the location).

Stated Preference is an appropriate method of valuation when local governments would like to get a sense of what the community would be willing to pay (in taxes for instance) to ensure the continued health of a service (e.g., the cost of maintaining forest cover to promote desired air quality).

In situations where a natural asset contributes multiple services to a public entity (e.g., water filtration and recreation) it may be necessary to employ more than one valuation technique at the same time to arrive at the value of an asset.

As has been well documented by MNAI and others, it is possible and often straightforward to calculate the services and corresponding service values for many types of natural assets. For example, it is now routine to calculate the water-filtration and storage services provided by wetlands, using modeling to ensure accuracy, and to determine with a high degree of precision the capital and operating costs of an engineered storage and filtration system required for the same task. There are ways to make direct market-value comparisons for many other services provided by natural assets that can be used to characterize service value.

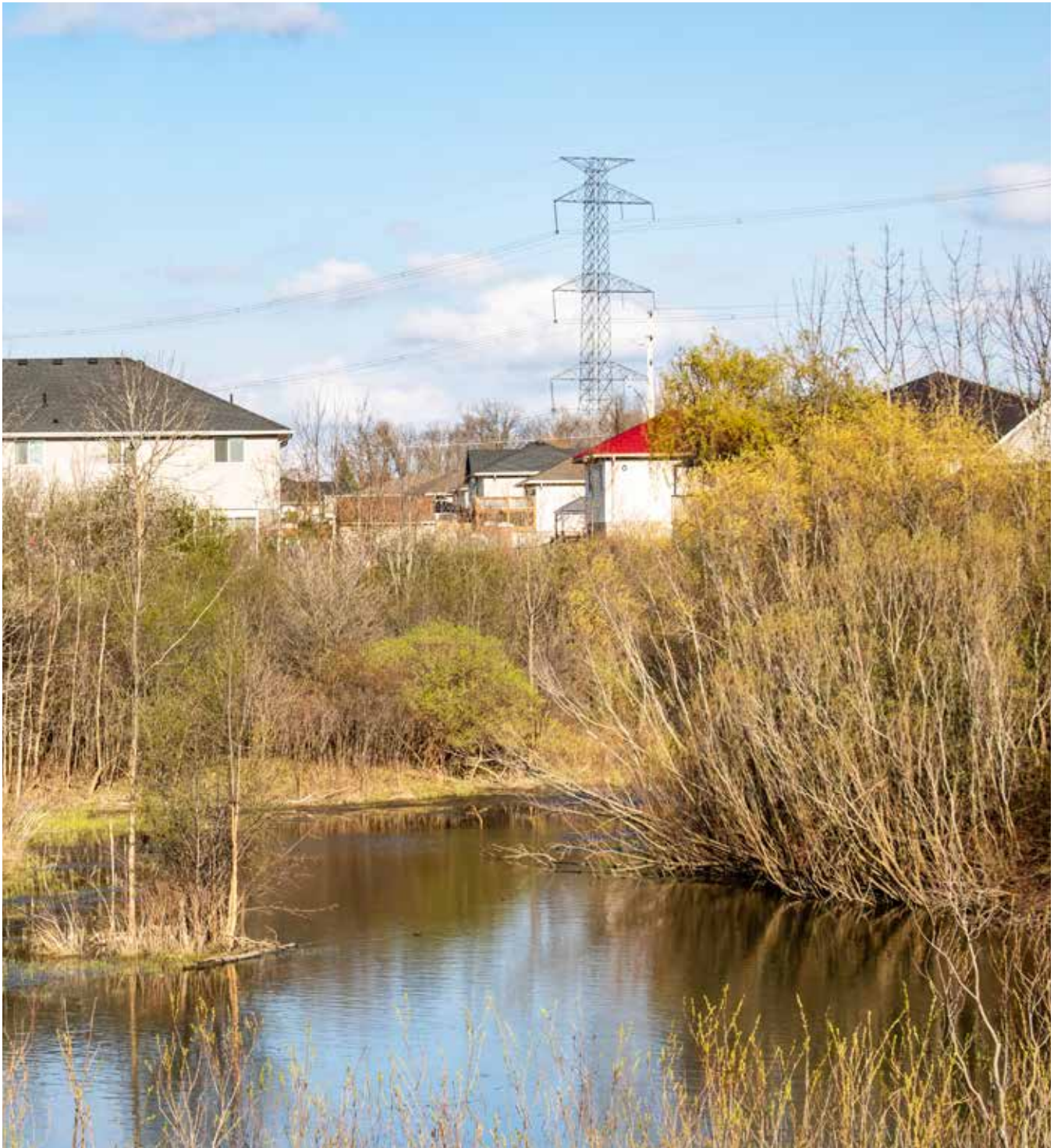
Further discussions may be required to determine *how* to calculate appropriate values of natural assets -- but not *whether* they exist, are tangible, and can be determined.

To foster more rapid inclusion of natural assets in financial statements, accounting efforts could focus on the ample array of natural assets and services for which valuation methods are the most developed. Similarly, local governments just starting work on natural asset management can also begin by assessing the role of natural assets in providing specific services that are of relevance to their community and most readily determined.

It should also be noted that the valuation of assets that are already recognized does not necessarily yield a precise "correct" answer; asset values may vary significantly over time according to short-term market fluctuations. While a wetland's services and corresponding value will typically depend on its context and location, the same is equally true of, for example, a

building whose value will vary according to its location, market conditions and other context-dependent factors.

Natural assets should not be held to a higher standard of accounting certainty than that demanded for other asset classes.



4. Evolution of International Approaches

On the international stage, the way in which “value” is accounted for is changing – standards must evolve to keep pace in Canada.



In March 2021, the 52nd United Nations Statistical Commission adopted the System of Environmental-Economic Accounting—Ecosystem Accounting (SEEA EA).³² This new statistical framework will enable countries to measure their natural capital, and understand the contributions of nature to prosperity and the importance of protecting it. In March 2020, the International Public Sector Accounting Standards Board (IPSASB) Natural Resources Project was established to address issues relating to the recognition, measurement, presentation and disclosure of natural resources. Its Project Brief notes that: “Items that are not recognized risk being mismanaged. Because natural resources are such a significant revenue source for many jurisdictions, the lack of recognition and measurement was highlighted as a public interest issue.”³³ The consultation paper that was recently published for comment, focused on financial reporting of tangible and naturally occurring resources, such as subsoil, water and living resources, in their natural state.³⁴

There are already moves in several countries to adopt natural capital accounting systems.



In the U.K., at the Office for National Statistics (ONS), natural capital accounts are being compiled annually, in line with the guidelines recommended by the United Nations SEEA EA.



In South Africa, the Accounting Standards Board’s Standard of Generally Recognized Accounting Practice (GRAP) Standard for Living and Non-living Resources (GRAP 110) was published in 2017. This standard prescribes the requirements for the recognition, measurement, presentation and disclosure of living resources, and the disclosure requirements for non-living resources.³⁵

In the United States, the Federal Accounting Standards



Advisory Board (FASAB) introduced guidance (which took effect in 2013) requiring federal entities to report the value of the federal government’s estimated royalties and other revenue from federal natural resources that are under lease, contract or other long-term agreement, and are reasonably estimable.³⁶ In addition, President Biden signed an Executive Order in April 2022, which included several actions under “enlisting nature in the fight against climate change”, including:³⁷

- for the Office of Management and Budget to issue valuation guidance to help agencies better account for services provided by ecosystems;
- an interagency initiative to improve and update baseline information on the economic value of existing natural assets and new nature-based solutions and;
- the first U.S. National Nature Assessment.

The focus on the importance of natural capital has also increased notably since the beginning of the COVID-19 pandemic. The value of natural assets to local communities and human well-being has been brought sharply into focus as a result of stay-at-home orders and restrictions on activities and travel.

The public sector – international institutions and countries – has recognized the monetary value of natural assets, and the private sector is rapidly following suit.

Asset managers, institutional investors, banks and insurance companies are also actively seeking opportunities to incorporate natural-capital considerations into investment decision-making and financial services. A key example is BlackRock, the world’s biggest asset manager. In a report detailing its

engagement priorities for 2021, BlackRock says: “All companies rely on natural capital in some way and, as the world transitions to a low-carbon economy, we ask companies to demonstrate how they are minimizing their negative impacts on, and ideally enhancing the stock of, the natural capital on which their long-term financial performance depends.”³⁸

Natural capital is an integral part of Environmental, Social and Governance (ESG) performance, the metrics of which are being used to determine credit ratings, including for public-sector entities. It is also an important factor for entities to consider when they set targets to meet the United Nations’ Sustainable Development Goals, such as the protection and restoration of ecosystems and efforts to halt the loss of biodiversity (Goal 15, “Life on Land”).³⁹

In Canada, Swiss Re, the Insurance Bureau of Canada, the Intact Centre on Climate Adaptation and MNAI have been exploring insurance products that would provide explicit coverage to protect natural assets against potential damage from natural disasters, such as earthquakes, hurricanes, floods, droughts and wildfires.⁴⁰ These new insurance products highlight the significance of natural assets to community well-being – and demonstrate that their protection merits attention similar to that afforded to traditional/grey infrastructure assets. Under this “parametric insurance,” claim payouts are triggered by a predefined

event such as a hurricane of a certain magnitude; the payout is almost immediate, in order to repair any damages to the natural asset so that it can continue to deliver its ecosystem benefits.

Institutional investors are also actively looking for investment opportunities to increase natural capital as part of their sustainable-finance initiatives. For example, Fondation in Quebec has employees whose specific role is to develop these investment opportunities. MNAI, together with not-for-profit global discovery organization Dark Matter Labs, is exploring scalable investment models of capital market financing for natural assets and ecosystems. This work will review existing innovative financing models and regulatory frameworks that could be used to finance the protection and restoration of natural assets, and the services they provided, without commodifying nature.

Major banks are also forecasting growth in the green-loan market in Canada, as an alternative financial instrument to green bonds. The preservation and restoration of natural capital projects could be funded by green loans, accessed by local governments. Public-sector entities that want to take advantage of new green financing opportunities may need to measure and account for a baseline value for their natural capital, in order to demonstrate their return on investment (ROI), which would logically be reflected in their financial position statements.

5. Progress and Next Steps

Canada is rich in natural assets that deliver economic and social benefits to public-sector entities and the people they serve, including carbon sequestration and storage, flood protection and biodiversity. There is also significant momentum in Canada to understand, account for, and ultimately protect and manage these natural assets to preserve the vital services they provide.



At a federal level, the definition of “infrastructure” in Canada has also been broadened in many circumstances to include “natural infrastructure”. For example:

- An advisory table on Resilient Natural and Built Infrastructure was established to inform development of Canada’s first National Adaptation Strategy.⁴¹
- There is a stated intention that the first National Infrastructure Assessment will cover “all sectors of economic, social, sustainable and natural infrastructure.”⁴²
- The Government of Canada’s Budget 2021 established a Natural Infrastructure Fund that is slated to receive \$200-million over the next three years (2022-2025).⁴³

In addition, the report “Human Activity and the Environment 2021: Accounting for ecosystem change in Canada”, published by Statistics Canada in 2022, represents an initial effort to make comprehensive information on Canada’s ecosystems and their condition more readily available.⁴⁴ This is part of ongoing work being undertaken to develop and implement a Canadian System of Environmental-Economic Accounts,⁴⁵ which is particularly welcomed.

A key challenge now is mainstreaming recognition of the role and value of natural assets within a timeframe that supports accelerated investment in natural-climate solutions, urgently required to tackle climate change and reverse biodiversity loss.

Three avenues are recommended for immediate focus:

- **Reverse Natural Asset Accounting Exclusions:** Remove the explicit exclusion of natural assets from public sector financial statements, understanding that this does not obligate public-sector entities to include natural resources in their financial position statements (action led by Public Sector Accounting Board).
- **Establish National Natural Asset Guidelines and Standards:** Establish practical guidelines and national standards for inventory, management, and valuation of local government natural assets. The current development of a national standard for natural asset inventory is the first step in this process (action led by Standards Council of Canada, with CSA Group, Public Sector Accounting Board and other standards setters).
- **Engage Financial Institutions in Nature-Positive Action:** Engage Canadian financial institutions and organizations in testing and refining the draft TNFD framework and making investments that build natural capital. This includes both making investments that “do no harm” as well as actively investing in solutions that enhance and restore nature and the ecosystem services provided to people (action led by Sustainable Finance Action Council).

These actions will help Canada enlist and work with nature in slowing climate change, reducing climate risk and reversing biodiversity loss, ultimately benefiting the well-being of people in Canada and beyond.

Appendix A

June 30, 2021

Michael Puskaric
Director
Public Sector Accounting Board
277 Wellington Street West
Toronto, ON M5V 3H2
info@psabcanada.ca

Re: “The Conceptual Framework for Financial Reporting in the Public Sector” and “Financial Statement Presentation, Proposed Section PS 1202” -- Consultation Response to Exposure Drafts

Dear Mr. Puskaric,

On behalf of the undersigned organizations, please find attached a consultation response to the exposure drafts that describe proposed revisions to the Public Sector Accounting Board's "Conceptual Framework for Financial Reporting in the Public Sector," and introduce the proposed new standard "Financial Statement Presentation, Section PS 1202."

This submission relates to the recognition of natural assets in Canadian public-sector accounting. Our response explains our position in relation to the need for public-sector accounting to be able to reflect the monetary value of natural assets in Canada, including carbon sequestration and storage, flood protection and biodiversity benefits. In particular, we recommend that the explicit exclusion of non-purchased natural resources be removed from the proposed new Financial Statement Presentation standard, Section PS 1202. The exclusion of natural assets from financial statements means that resources available to public-sector entities are not faithfully represented. The removal of this exclusion -- thereby permitting the inclusion of natural assets -- would not obligate a public-sector entity to recognize its natural assets.

We also recommend that the PSAB undertake a project to develop guidance about the recognition and measurement of natural resources, similar to projects under way at the International Public Sector Accounting Standards Board. With guidance, public-sector entities that are already prepared to recognize natural assets in their financial statements could do so in a consistent manner.

We appreciate the opportunity to comment on this very important undertaking, and would be pleased to provide any additional information that may be required. We also welcome the opportunity to assist PSAB in the development of standards and guidance materials to support public-sector entities to incorporate natural assets in their financial statements.

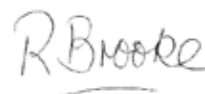
Yours sincerely,



Joanna Eyquem, P. Geo, ENV SP, CWEM, CEnv,
Managing Director, Climate-Resilient Infrastructure, Intact Centre on Climate Adaptation, University of Waterloo



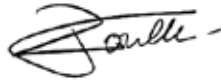
Bailey Church, CPA, CA, CIA
Partner, Professional Practice
KPMG Canada



Roy Brooke
Executive Director,
Municipal Natural Assets Initiative



Sonia Baxendale
President and CEO,
Global Risk Institute



Florian Roule
Senior Director, Strategy and
Partnerships, Head of Sustainable
Finance, Finance Montréal



Kevin Travers
Partner, Infrastructure Government
and Healthcare Practice
KPMG Canada



Jonathan Fowlie
Chief External Relations Officer,
Vancouver City Savings Credit Union



Craig Stewart
Vice President, Federal Affairs
Insurance Bureau of Canada



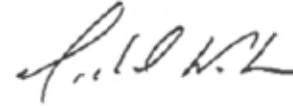
Jennifer Place
Board Chair
Government Finance Officer of Alberta
(GFOA)



Dr Richard Florizone
President & CEO,
International Institute for Sustainable
Development



Dr Susan Black
President and CEO,
The Conference Board of Canada




Mike Wilson
Executive Director,
Smart Prosperity Institute



Sean Kidney
CEO,
Climate Bonds Initiative



Rachel Samson
Clean Growth Research Director,
Canadian Institute for Climate Choices



Blair Feltmate, Ph.D.
Head, Intact Centre on Climate
Adaptation,
University of Waterloo



Robert Siddall, FCPA, FCA
Independent



Julie Gelfand
Former Federal Commissioner of
Environment and Sustainable
Development, Office of the Auditor
General of Canada



Carole Saab
CEO
Federation of Canadian Municipalities



Sandra Califaretti, CPA, CA
Director, Accounting Services
City of Toronto



Raoul Cyr, CPA, CA
Directeur Comptabilité et informations
financières,
Ville de Montréal



Julia Aspinall, CPA, CMA
Director, Financial Services
City of Vancouver



Michel Houle, CPA, CMA
VP, Corporate Services and CFO,
National Capital Commission



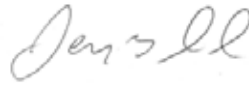
Jeffrey J. Jackson, MBA, CPA, CA
Director of Finance and Treasurer
City of Mississauga



Colleen Sklar
Executive Director,
Winnipeg Metropolitan Region



Mark Medeiros
Acting Treasurer,
City of Brampton



Jerry Blackwood, CPA, CGA
CFO,
Halifax Regional Municipality



Michael Coroneos, CPA, CMA
Deputy City Manager, Chief Financial
Officer & Treasurer,
City of Vaughan



Lisa Helps
Mayor,
City of Victoria



Andy Wardell, CPA, CGA,
General Manager, Finance & Chief
Financial Officer
District of North Vancouver



Moya J. Leighton CPA, CGA, MBA
Town Treasurer & Director of Finance
Town of Halton Hills



Myriah Foort, BBA, CPA, CA
Chief Financial Officer
Comox Valley Regional District



Jenn Hepting
Chief Financial Officer /
Director of Finance,
City of Colwood



Isabel Gordon, MBA, CPA
Director, Financial Services,
District of West Vancouver



Emanuel Machado
Chief Resiliency Officer
Town of Gibsons



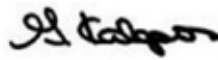
Sarah Pacey
Chief Administrative Officer,
Town of Florenceville-Bristol



Kevin Wilkinson, CPA, CA, MBA
Controller,
Windsor-Detroit Bridge Authority



Will Cole-Hamilton
Steering Committee,
Climate Caucus



Gabriella Kalapos
Executive Director
Clean Air Partnership



Edward McDonnell
CEO,
Greenbelt Foundation



Gerard McDonald, MBA, P.Eng., ICD.D
Chief Executive Officer,
Engineers Canada



Andrea Waldie, P.Geo., FGC
Chief Executive Officer
Geoscientists Canada



Dan Huang RPP, MCIP
President
Canadian Institute of Planners



Michael Leering P.Eng.
Director, Environment and Business
Excellence Standards
CSA Group



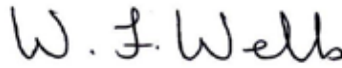
Christopher Chen
Executive Director
Asset Management Ontario



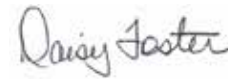
Jennifer Court
Executive Director
Green Infrastructure Ontario



Catherine Lavoie
Présidente-directrice générale
Centre d'expertise et de recherche en
infrastructures urbaines (CERIU)



Wally Wells P.Eng.
Executive Director
Asset Management BC



Daisy Foster
Managing Director,
Atlantic Infrastructure Management
(AIM) Network



Bernadette O'Connor
Manager, Municipal Asset
Management, Canada
WSP Canada Inc.



Jeff Atherton, P.Eng.
Senior Asset Management Consultant
AECOM Canada Ltd



Ron Scheckenberger, P.Eng.
Principal,
Wood Canada Ltd



Jennifer Petruniak, PMP.
Technical Lead, Environmental
Services
Dillon Consulting



Al Beaver
Executive Director.
Wildland Fire Risk Management Ltd



Robert Smith
Principal,
Midsummer Analytics



Alain Bourque
Directeur général
Ouranos - Consortium sur les
changements climatiques



Jérôme Dupras, Ph.D.
Professeur agrégé, Titulaire, Chaire de
recherche du Canada en économie
écologique, Université du Québec en
Outaouais



Dr Saul Klein
Dean, Gustavson School of Business,
University of Victoria



Susan Nesbitt, Ph.D. P.Eng.
Professor, Co-Director, Urban Systems
Master of Engineering Leadership,
The University of British Columbia



Deborah Harford
Executive Director
Adaptation to Climate Change Team,
Simon Fraser University



Robert Wilson
Director of Conservation Finance,
Nature Conservancy of Canada



Meghan Leslie
President and CEO,
WWF-Canada



Jay Ritchlin
Director-General, Western
Canada/National Nature portfolio lead
David Suzuki Foundation



Marcy Sullivan, CPA, CA
Chief Financial Officer
Ducks Unlimited Canada



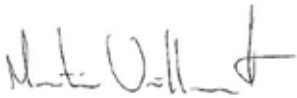
Laura Cui, CPA, CGA
National Director of Finance,
Canadian Parks and Wilderness
Society (CPAWS)



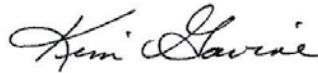
Lara Ellis
Senior Vice-President, Policy and
Partnerships,
ALUS



Antoine Verville
Directeur général,
Regroupement des organismes de
bassins versants du Québec



Martin Vaillancourt
Directeur général,
Regroupement national des conseils
régionaux de l'environnement du
Québec



Kim Gavine
General Manager,
Conservation Ontario



Deborah Martin-Downs
CAO
Credit Valley Conservation



Hassaan Bassit
President and CEO,
Conservation Halton



DG Blair
Executive Director,
Stewardship Centre for BC

Proposed Changes to the PSA Handbook's Conceptual Framework and Context

The PSAB notes that its current Conceptual Framework for Financial Reporting in the Public Sector specifies that certain types of assets are to be excluded from recognition in financial statements: "These exclusions relate to:

- natural resources and Crown lands that have not been purchased;
- developed and inherited intangibles; and
- works of art and historical treasures."

The PSAB is proposing to relocate these exclusions from the Conceptual Framework to its new standard for Financial Statement Presentation, Section PS 1202; it says "such exclusions are standards-level decisions, not concepts underlying financial statements."¹

The PSAB has concluded that "before these exclusions can be removed, each type of economic resource must be considered individually. Appropriate guidance regarding their recognition and measurement must be provided."²

Response

- Canada is rich in natural capital, or natural assets (the stock of natural resources and ecosystems), that deliver economic benefits to public-sector entities. Under the proposed changes to the PSAB Conceptual Framework, this wealth will remain explicitly excluded from public-sector financial statements, except where natural assets have been damaged and have needed to be recreated/restored, or have otherwise effectively been "purchased."
- Failure to recognize, in any form, the value of intact "inherited" natural assets understates the resources available to a public-sector entity to provide services. This conflicts with the financial reporting objective noted in Chapter 6 of the proposed Conceptual Framework: "reporting [an entity's] financial position." Paragraph 6.15 observes: "To make such assessments, users require information about the total economic resources available to serve the public and the total claims on those resources (i.e., economic obligations) at the financial statement date."
- By excluding the value of their inherited natural assets, public-sector entities are not providing adequate information about all assets - users do not have information about the state of natural assets, or their potential impairment. This lack of information has historically led to the mismanagement of natural assets, and to the deterioration of the services they provide to the communities and economies over which public-sector entities have jurisdiction. Degraded natural assets may also present otherwise undocumented liabilities.
- It is also critical that public-sector entities account for, and value, the carbon sequestration and storage services of natural assets, which can be used to offset greenhouse gas emissions and contribute to fulfilling Canada's commitment to achieving net-zero emissions by the year 2050.
- Reliable methods of measurement and data collection already exist for valuing natural assets, are tried and tested in Canada, and are already being applied by local public-sector entities to inform their asset-management planning. Without a recognition of natural assets in financial statements, there is a disconnect between asset management and financial reporting, which contradicts the close linkage established between existing assets and liabilities.

- By allowing the value of natural assets to be recognized in the Statement of Financial Position, the PSAB can support public-sector entities in making more financially sound decisions about the management of natural assets in the short, medium and long term.
- In addition to removing the exclusion of non-purchased natural resources from the PSAB Conceptual Framework, we recommend that **the explicit exclusion of non-purchased natural resources be removed from the proposed new Financial Statement Presentation standard, Section PS 1202**. This removal would enable public-sector entities that are ready to recognize natural assets in their financial statements to do so in a consistent and defined manner. The removal of this exclusion -- thereby permitting the inclusion of natural assets -- would not obligate a public-sector entity to recognize its natural assets.
- The PSAB should regard natural assets as a **priority topic** from now on, and the inclusion of natural assets in the financial statements of public-sector entities should be addressed in the forthcoming 2022-2027 Strategic Plan. Future work could include, for example, incorporating consideration of natural assets within the technical agenda and in a Statement of Recommended Practice. In the absence of timely and concerted action, the risk is that public-sector accounting standards will become less relevant in a world where natural capital is increasingly recognized as a central part of Canada's economy by investors, accountants, economists and public-sector entities.

Endnotes

¹ Public Sector Accounting Board. 2021. "Exposure Draft -- The Conceptual Framework for Financial Reporting in the Public Sector," p. iv. Accessed at: <https://www.frascanada.ca/en/public-sector/documents/psab-ed-conceptual-framework>

² Public Sector Accounting Board. 2021. "Exposure Draft -- The Conceptual Framework for Financial Reporting in the Public Sector," p.111. Accessed at: <https://www.frascanada.ca/en/public-sector/documents/psab-ed-conceptual-framework>

Endnotes

All documents were accessed on August 8, 2022.

- 1 International Union for Conservation of Nature. 2020. “IUCN Global Standard for Nature-based Solutions: a user-friendly framework for the verification, design and scaling up of NbS : first edition.” Accessed at: <https://portals.iucn.org/library/node/49070>
- 2 Girardin, C., Jenkins, S., et al. 2021. “Nature based solutions can help cool the planet.” *Nature*. vol. 593, pp.191-194. DOI: <https://doi.org/10.1038/d41586-021-01241-2>
- 3 Griscom, B.W., Adams, J., et al. 2017. “Natural climate solutions.” *Proceedings of the National Academy of Sciences*, vol. 114, no.44, pp.11645-11650. DOI: <https://doi.org/10.1073/pnas.1710465114>
- 4 Municipal Natural Assets Initiative. 2017. “Defining and Scoping Municipal Natural Assets.” Accessed at: <https://www.assetmanagementbc.ca/wp-content/uploads/definingscopingmunicipalnaturalcapital-final-15mar2017.pdf>
- 5 Haines-Young, R. and M.B. Potschin. 2018. “Common International Classification of Ecosystem Services (CICES) V5.1 and Guidance on the Application of the Revised Structure.” Accessed at: <https://cices.eu/content/uploads/sites/8/2018/01/Guidance-V51-01012018.pdf>
- 6 Dasgupta, P. 2021. “The Economics of Biodiversity: The Dasgupta Review.” HM Treasury. London. Accessed at: <https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review>
- 7 World Economic Forum. 2020. “Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy.” New Nature Economy Series. In collaboration with PwC. Accessed at: https://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf
- 8 World Economic Forum. 2022. “Davos 2022: A key milestone in a pivotal year for nature action.” Accessed at: <https://www.weforum.org/agenda/2022/05/davos-2022-a-key-milestone-in-a-pivotal-year-for-nature-action-f8d852f23e/>
- 9 Government of Canada. 2021. “G7 2030 Nature Compact.” Accessed at: https://www.international.gc.ca/world-monde/international_relations-relations_internationales/g7/documents/2021-06-13-nature_compact-nature_horizon-2030.aspx?lang=eng
- 10 United Nations Environment Programme. 2021. “State of Finance for Nature 2021.” Nairobi. Accessed at: <https://www.unep.org/resources/state-finance-nature>
- 11 Moudrak, N., Feltmate, B., Venema, H., Osman, H. 2018. “Combating Canada’s Rising Flood Costs: Natural infrastructure is an underutilized option.” Prepared for Insurance Bureau of Canada. Intact Centre on Climate Adaptation, University of Waterloo. Accessed at: https://www.intactcentreclimateadaptation.ca/wp-content/uploads/2018/09/IBC_Wetlands-Report-2018_FINAL.pdf
- 12 Eyquem, J. L, and B. Feltmate. 2022. “Irreversible Extreme Heat: Protecting Canadians and Communities from a Lethal Future.” Intact Centre on Climate Adaptation, University of Waterloo. Accessed at: <https://www.intactcentreclimateadaptation.ca/irreversible-extreme-heat-protecting-canadians-and-communities-from-a-lethal-future/>
- 13 Ontl, T.A. and Schulte, L.A. 2012. “Soil Carbon Storage.” *Nature Education Knowledge*, vol. 3, 35. Accessed at: <https://www.nature.com/scitable/knowledge/library/soil-carbon-storage-84223790/>

- 14 Kettles, I. M. and Tarnocai, C. 1999. “Development of a model for estimating the sensitivity of Canadian peatlands to climate warming.” *Géographie physique et Quaternaire*. vol. 53, no. 3, pp. 323–338. DOI : <https://doi.org/10.7202/004838ar>
- 15 Environment and Climate Change Canada. 2022. “2030 Emissions Reduction Plan - Canada’s Next Steps for Clean Air and a Strong Economy.” Accessed at: https://publications.gc.ca/collections/collection_2022/eccc/En4-460-2022-eng.pdf
- 16 Government of Canada. 2022. “Carbon pollution pricing systems across Canada.” Accessed at: <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work.html>
- 17 Government of Canada. 2022. “Canada’s Greenhouse Gas Offset Credit System.” Accessed at: <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system.html>
- 18 Government of Canada. 2021. “Budget 2021: A Recovery Plan for Jobs, Growth, and Resilience.” Accessed at: <https://www.budget.gc.ca/2021/home-accueil-en.html>
- 19 Ibid.
- 20 Government of Canada. 2022. “Budget 2022: A Plan to Grow Our Economy and Make Life More Affordable.” Accessed at: <https://budget.gc.ca/2022/home-accueil-en.html>
- 21 Chartered Professional Accountants of Canada. 2019. “Enhancing Climate-related Disclosure by Cities: A Guide to Adopting the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).” Accessed at: <https://www.cpacanada.ca/en/business-and-accounting-resources/financial-and-non-financial-reporting/sustainability-environmental-and-social-reporting/publications/tcfd-guide-for-cities>
- 22 Taskforce on Nature-Related Financial Disclosures. 2022. “TNFD Nature-Related Risk & Opportunity Management and Disclosure Framework, v0.2 Beta Release.” Accessed at: <https://tnfd.global/the-tnfd-framework/tnfd-framework-summary/#draft-disclosure-recommendations>
- 23 Taskforce on Nature-Related Financial Disclosures. 2022. “The TNFD Forum.” Accessed at: <https://tnfd.global/about/the-tnfd-forum/>
- 24 Ibid.
- 25 Government of Canada. 2021. “G7 Finance Ministers and Central Bank Governors Communiqué.” 5 June 2021. Accessed at: <https://www.canada.ca/en/department-finance/programs/international-trade-finance-policy/g7-finance-ministers-central-bank-governors-communique.html>
- 26 Municipal Natural Assets Initiative. 2020. “Cohort 2 National Projects Overview.” Accessed at: <https://mnai.ca/media/2020/02/MNAI-CohortSummary.pdf>
- 27 Wood, S.L.R., Dupras, J., Bergevin, C., Kermagoret, C. 2019. “La valeur économique des écosystèmes naturels et agricoles de la Communauté métropolitaine de Québec et de la Table de concertation régionale pour la gestion intégrée du Saint-Laurent.” Ouranos. Accessed at: https://cmquebec.qc.ca/wp-content/uploads/2019/09/2019-09_Valeur-%C3%A9conomique-ecosyst%C3%A8mes_UQO_Rapport-final.pdf
- 28 Dupras, J., L’Ecuyer-Sauvageau, C., Auclair, Jeffrey & He, J. & Poder, T. 2016. “Natural Capital: The economic value of National Capital Commission green network.” Accessed at: https://ncc-website-2.s3.amazonaws.com/documents/natural_capital_economic_value_ncc_green_network_final_dec_1_web.pdf
- 29 Greenbelt Foundation. 2019. “Investing in the Future: The Economic Case for Natural Infrastructure in Ontario.” Accessed at: https://www.greenbelt.ca/economic_case
- 30 Wood, S.L.R., Dupras, J., Bergevin, C., Kermagoret, C. 2019. La valeur économique des écosystèmes naturels et agricoles de la Communauté métropolitaine de Québec et de la Table de concertation régionale

- pour la gestion intégrée du Saint-Laurent. Ouranos. 75 p. Accessed at: https://cmquebec.qc.ca/wp-content/uploads/2019/09/2019-09_Valeur-%C3%A9conomique-ecosyst%C3%A8mes_UQO_Rapport-final.pdf
- 31 Dupras, J., L'Ecuyer-Sauvageau, C., Auclair, Geoffrey & He, J. & Poder, T. 2016. "Natural Capital: The economic value of National Capital Commission green network." Accessed at: [https://ncc- https://ncc-website-2.s3.amazonaws.com/documents/natural_capital_economic_value_ncc_green_network_final_dec_1_web.pdf](https://ncc-https://ncc-website-2.s3.amazonaws.com/documents/natural_capital_economic_value_ncc_green_network_final_dec_1_web.pdf)
- 32 UN Statistical Commission. 2021. "System of Environmental-Economic Accounting—Ecosystem Accounting." Final Draft, Version 5. February 2021. Accessed at: https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf
- 33 International Public Sector Accounting Standards Board. 2020. "Natural Resources Project Brief and Outline." Accessed at: <https://www.ifac.org/system/files/uploads/IPSASB/Natural%20Resources%20Project%20Brief%20Final%20March%2027%2C%202020.pdf>
- 34 International Public Sector Accounting Standards Board. 2022. "IPSASB Launches Consultation Paper on Accounting for Natural Resources." Accessed at: <https://www.ipsasb.org/news-events/2022-05/ipsasb-launches-consultation-paper-accounting-natural-resources>
- 35 Accounting Standards Board. 2019. "Standard of Generally Recognised Accounting Practice. Living and Non-Living Resources (GRAP 110), South Africa." Accessed at: <https://www.asb.co.za/wp-content/uploads/2019/04/GRAP-110-Living-and-Non-living-Resources-2019clean.pdf>
- 36 Federal Accounting Standards Advisory Board. 2011. "Accounting for Federal Natural Resources Other than Oil and Gas." Technical Bulletin 2011-1. Accessed at: http://files.fasab.gov/pdffiles/original_tech_bulletin_2011_1.pdf
- 37 The White House. 2022. "FACT SHEET: President Biden Signs Executive Order to Strengthen America's Forests, Boost Wildfire Resilience, and Combat Global Deforestation." April 22, 2022. Accessed at: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/04/22/fact-sheet-president-biden-signs-executive-order-to-strengthen-americas-forests-boost-wildfire-resilience-and-combat-global-deforestation/>
- 38 BlackRock Investment Stewardship. 2021. "Our approach to engagement on natural capital, March 2021." Accessed at: <https://www.blackrock.com/corporate/literature/publication/blk-commentary-engagement-on-natural-capital.pdf>
- 39 United Nations, Department of Economic and Social Affairs - Sustainable Development. 2021. "The 17 goals." Accessed at: <https://sdgs.un.org/goals>
- 40 Municipal Natural Assets Initiative. 2020. "Innovative, new, nature-based insurance product to help protect natural assets." Accessed at: <https://mnai.ca/insurance-protect-natural-assets/>
- 41 Government of Canada. 2022. "Canada's National Adaptation Strategy." Accessed at: <https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/national-adaptation-strategy.html>
- 42 Infrastructure Canada. 2021. "Building Pathways to 2050: Moving Forward on the National Infrastructure Assessment." Accessed at: <https://www.infrastructure.gc.ca/alt-format/pdf/nia-eni/nia-eni-2-en1.pdf>
- 43 Government of Canada. 2021. "Budget 2021. A Recovery Plan for Jobs, Growth, and Resilience." Accessed at: <https://www.budget.gc.ca/2021/home-accueil-en.html>
- 44 Statistics Canada. 2022. "Human Activity and the Environment 2021: Accounting for ecosystem change in Canada." Accessed at: <https://www150.statcan.gc.ca/n1/en/pub/16-201-x/16-201-x2021001-eng.pdf?st=81IXc2zi>
- 45 Statistics Canada. 2022. "Canadian System of Environmental-Economic Accounts - Ecosystem Accounts." Accessed at: <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5331>



To find out more:

Joanna Eyquem PGeo. ENV SP. CWEM. CEnv.

Managing Director, Climate-Resilient Infrastructure

Intact Centre on Climate Adaptation

Faculty of Environment, University of Waterloo

514-268-0873 | joanna.eyquem@uwaterloo.ca

www.intactcentre.ca | Twitter [@ICCA_Canada](https://twitter.com/ICCA_Canada)



UNIVERSITY OF
WATERLOO

INTACT CENTRE
ON CLIMATE ADAPTATION