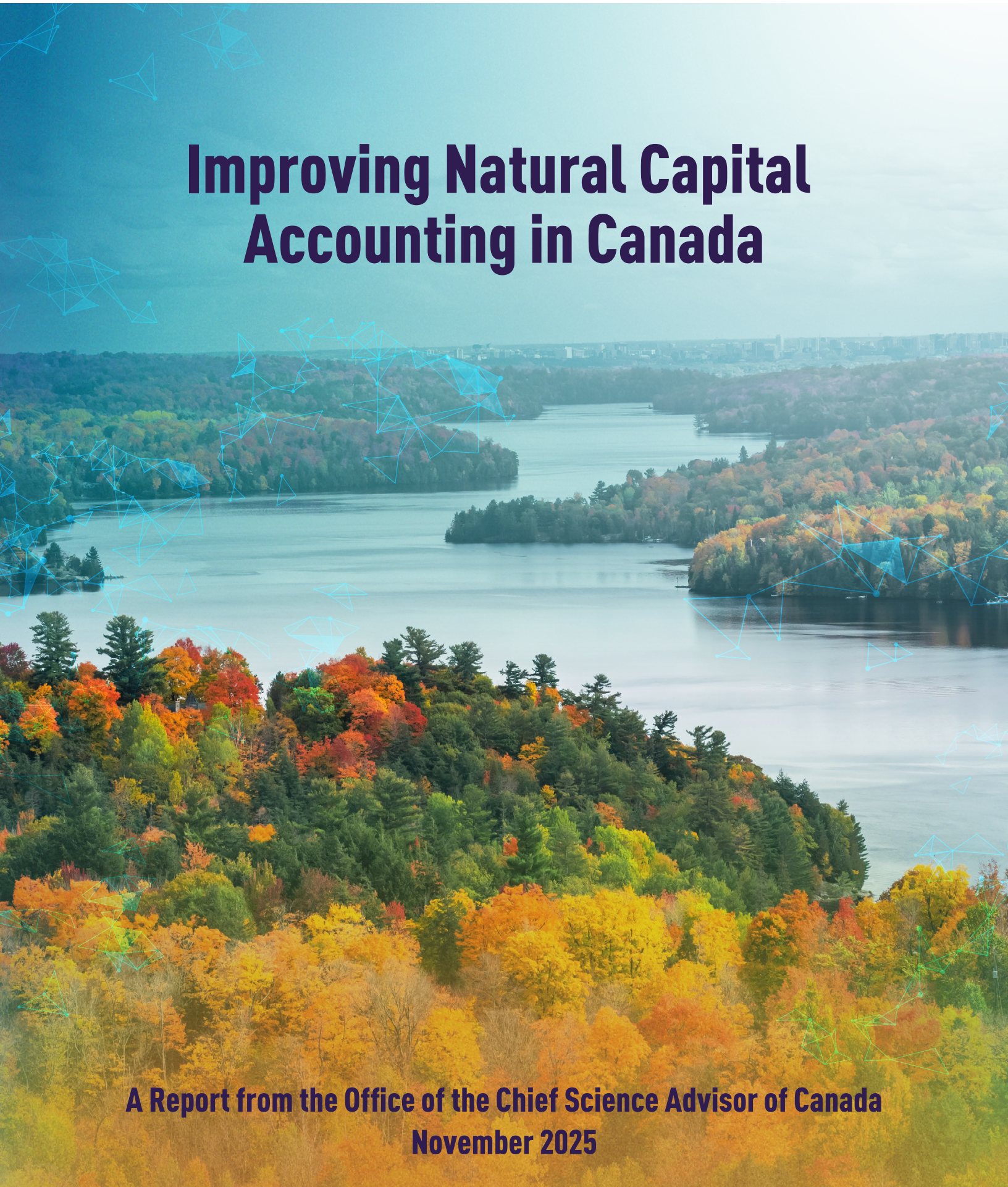
Office of the Chief Science Advisor of Canada
Bureau du conseiller scientifique en chef du Canada
Canada

Improving Natural Capital Accounting in Canada



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Improving Natural Capital Accounting in Canada

EXECUTIVE SUMMARY

Canada's 2030 Nature Strategy[1] represents the country's roadmap for fulfilling its commitments under the Kunming–Montreal Global Biodiversity Framework (GBF).[2] The strategy commits Canada to a whole-of-government and whole-of-society approach to ensuring coordinated action across environmental, economic and social priorities.

Natural capital accounting plays a key role in supporting this approach by providing information on the benefits people receive from physical stocks of natural capital assets and the flows of services they generate,[3] such as clean water from wetlands, carbon sequestration by forests, pollination by insects and recreational opportunities in parks. Under the GBF, natural capital accounting is critical for achieving Goal B – Prosper with Nature, which focuses on the sustainable use and management of nature's contributions to people, encompassing a wide range of biodiversity values. It also contributes to several headline indicators, for example, those related to the extent of natural ecosystems (A.2) and ecosystem services (B.2).

To support progress toward these goals, the Chief Science Advisor convened a roundtable in the summer of 2024, bringing together 23 national and international experts from academia, government and the private sector. The group explored how Canada's natural capital accounting practices could be improved. Four main themes emerged from the discussion and follow-up:

- **Different natural capital accounting approaches designed for different purposes exist.** Which values of nature are not well captured therein and how this affects decision making must be assessed.
- **Improved data and methods are needed.** Enhancing the quality, resolution and relevance of data is essential to better capture and monitor changes in natural capital stocks and flows in physical terms and their implications for various values of nature.

1 Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada [PDF - 4014Kb], available at: https://publications.gc.ca/collections/collection_2024/eccc/en4/En4-539-1-2024-eng.pdf. Accessed April 24, 2025.
2 Conference of the Parties to the Convention on Biological Diversity, Fifteenth Meeting, Montreal, Canada 7–19 Dec. 2022, Agenda Item 9A, available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf. Accessed April 24, 2025.
3 United Nations. 2020. Natural Capital Accounting for Integrated Biodiversity Policies, available at: https://seea.un.org/sites/seea.un.org/files/seea_-_biodiversity_-_web_ready.pdf. Accessed April 24, 2025.

- **Natural capital assets have associated monetary (e.g., timber, tourism), welfare (e.g., clean air, flood protection) and non-monetary values (e.g., cultural identity, spiritual significance).** Each type contributes to the overall value of nature and must be assessed using methods appropriate to each type.[4]
- **Indigenous and local communities** have culturally relevant and historically vested relationships with nature. Recognizing and assessing the related values of nature require inclusive and culturally grounded approaches.

This report outlines several actionable recommendations to support Canada's progress in these areas. They include:

1. Strengthening data quality and methods for natural capital assessment, such as spatial and temporal resolution and use of remote sensing and artificial intelligence tools;
2. Improving transparency of methods for comprehensive natural capital valuation, and the contextualization of data sources by linking services to specific ecosystems;
3. Ensuring future implementations of the System of Environmental Economic Accounting (SEEA) integrate both welfare and non-monetary values using participatory approaches and flexible accounting models;
4. Developing a strategy to meet commitments to Indigenous Peoples and local communities by supporting Indigenous-led biodiversity conservation based on natural capital valuation.

The implementation of these recommendations would help ensure that policy development and decision-making fully account for the diverse benefits provided by nature, thereby advancing science-based governance and contributing to the ongoing effort to safeguard Canada's biodiversity for generations to come.

4 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). 2024. Methodological assessment regarding the diverse conceptualization of multiple values of nature and its benefits, including biodiversity and ecosystem functions and services, available at: https://www.ipbes.net/the-values-assessment. Accessed April 24, 2025.

BACKGROUND

Canada's 2030 Nature Strategy[5] outlines the country's approach to fulfilling its commitments under the Kunming–Montreal Global Biodiversity Framework (GBF).[6] As a signatory to the GBF, Canada pledged to achieve its four overarching goals and 23 specific targets.

The world's growing demand for natural resources puts them at risk of overexploitation and presents decision-makers with difficult choices as they strive to balance economic growth with environmental sustainability. Economists and policymakers have long recognized the critical role of natural resources in fostering economic development and hence, recognized that information on the stocks of these resources and the flows of benefits from them should be integrated into systems of national accounts.[7]

In 2012, the United Nations (UN) established the System of Environmental Economic Accounting Central Framework (SEEA-CF), a method for integrating stocks of natural capital[8] into national accounting systems.[9] In 2021, the SEEA Ecosystem Accounting (SEEA-EA)[10] was added to complement the original framework by providing a coherent approach to estimating ecosystem extent, condition and services in both physical and monetary terms.[11] SEEA-EA represents an important attempt to expand the SEEA-CF to include a broader set of natural capital assets.

Natural capital accounting (NCA) provides information on the values derived from natural capital assets, meaning the benefits people receive from the physical stocks of these assets and the flows of services they provide over time (e.g., clean water from rivers, carbon storage in forests, pollination by insects and recreational opportunities in natural areas). At the national level, NCA –

5 Canada's 2030 Nature Strategy: Halting and Reversing Biodiversity Loss in Canada, available at: https://publications.gc.ca/collections/collection_2024/eccc/en4/En4-539-1-2024-eng.pdf. Accessed April 24, 2025.

6 Conference of the Parties to the Convention on Biological Diversity, Fifteenth Meeting, Montreal, Canada 7–19 Dec. 2022, Agenda Item 9A, available at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf. Accessed April 24, 2025.

7 United Nations. 2025. The System of National Accounts (SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity using internationally agreed concepts, definitions, classifications and accounting rules. National accounts are one of the inputs to macroeconomic statistics forming a basis for economic analysis and policy formulation. See https://unstats.un.org/unsd/nationalaccount/sna.asp. Accessed April 24, 2025.

8 "Natural capital is another term for the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people." Schumacher E.F. (1973) Small is Beautiful. London: Harper and Row.

9 United Nations (2014) System of Environmental-Economic Accounting 2012 – Central Framework (SEEA CF). New York: United Nations. Available at: https://seea.un.org/sites/seea.un.org/files/seea_cf_final_en.pdf. Accessed April 24, 2025.

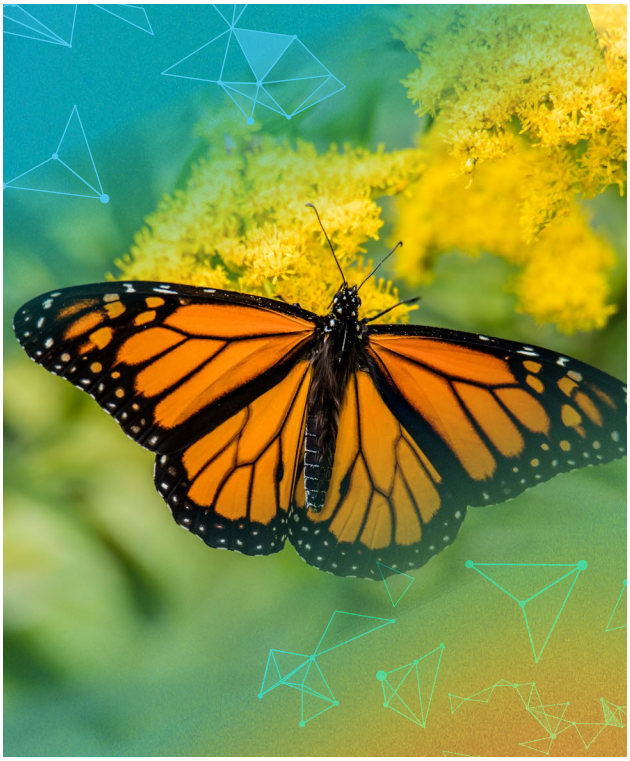
10 United Nations et al. (2021). System of Environmental-Economic Accounting – Ecosystem Accounting (SEEA EA). New York: United Nations. Available at: https://seea.un.org/sites/seea.un.org/files/documents/EA/seea_ea_f124_web_9dec24.pdf. Accessed April 24, 2025.

11 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (n.d.). Policy Support Tool: System of Environmental-Economic Accounting. Available at: https://www.ipbes.net/policy-support/tools-instruments/system-environmental-economic-accounting. Accessed April 24, 2025.

through frameworks like SEEA-CF and SEEA-EA – can be linked with a country's economic statistics, helping governments see how nature contributes to the economy alongside traditional measures, like a country's gross domestic product (GDP). Other approaches to natural capital accounting also exist, however, and are designed for different decision-making contexts and purposes other than country-level assessments. For example, NCAs can be developed for border-spanning regions involving more than one country, or for private landholders.[12]

The United Kingdom's 2021 report, The Economics of Biodiversity: The Dasgupta Review,[13] notes that an important step toward reversing the loss of nature's goods and services is the incorporation of natural capital accounting into systems of national accounts, such that measurement of wealth spans all assets, including natural assets. To date, Canada and 93 other countries have implemented the SEEA.

While UN adoption of the SEEA is somewhat recent, the development of NCA approaches started in the 1970s, and draft SEEA versions were available in the 1990s. Canada was not among the earliest pioneers (such as the Netherlands, the UK and Australia), but it can be characterized as an early-to-mid adopter. Canada has been experimenting with and producing environmental-economic accounts for a few decades now, with Statistics Canada publishing physical flow and asset accounts as well as experimental ecosystem accounts.[14] These accounts already feed into the Canadian Environmental Sustainability Indicators[15] and support federal



12 Implementations of natural capital accounting have been developed for organizations rather than national or sub-national jurisdictions (see for example the Natural Capital Protocol, available at: https://capitalscoalition.org/capitals-approach/natural-capital-protocol/?fwp_filter_tabs=guide_supplement), with some designed to be compliant with international standards (see for example ISO standard 14054 (https://committee.iso.org/sites/tc207sc1/home/projects/ongoing/iso-14054-natural-capital.html. Accessed April 24, 2025).

13 Dasgupta, P. (2021). The Economics of Biodiversity: The Dasgupta Review. Full Report. 610 pages. (London: HM Treasury) Available at: https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review. Accessed April 24, 2025.

14 Statistics Canada. 2024. Methodological Guide: Canadian System of Environmental-Economic Accounting. Available at: https://www150.statcan.gc.ca/n1/pub/16-509-x/16-509-x2016001-eng.htm. Accessed April 24, 2025.

15 The Canadian Environmental Sustainability Indicators (CESI) provide science-based measures of environmental issues such as climate change, air and water quality, and biodiversity. Available at: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/about-sustainability.html. Accessed October 22, 2025.

sustainability reporting. Canada is therefore an active and credible international player in this area. However, like in most countries, the influence of NCA on day-to-day government decision-making remains limited and is still evolving.

In 2021, Canada established the Census of Environment, administered by Statistics Canada,[16] to track Canada's ecosystem assets and associated ecosystem services with the goal of delivering a full picture of the complex relationships among ecosystems, the economy, society and human well-being. The census organizes data according to the SEEA-EA international statistical standard, and thus findings are compatible with other statistics, comparable across regions, and aligned with global models.[17]

More recently, Canada joined Australia and the United States in the 2023 Partnership on Cooperation on Nature Capital Accounting, Environmental-Economic Accounting, and Related Statistics. This collaboration aims to promote cooperation on natural capital accounting and environmental-economic statistics by way of senior official dialogue, a technical working group, and global leadership to develop a unified approach grounded in the SEEA.[18] The partnership seeks to ensure that nature is valued consistently with validated measures and as comprehensively as needed to support policy development and decision making.

CONTEXT

In 2024, the Chief Science Advisor of Canada convened several roundtables of national and international experts to address specific challenges related to Canada's implementation of the GBF. One of the roundtables brought together 23 Canadian and international experts in the field of natural capital accounting to evaluate current approaches to natural capital accounting, identify any limitations and explore ways to overcome them. The complete list of roundtable participants is provided in Appendix A. This report is based on the roundtable deliberations as well as follow-up work in response to advice and comments received from the experts.

16 Statistics Canada. 2025. Census of the Environment. Available at: https://www.statcan.gc.ca/en/census-environment. Accessed April 24, 2025.
17 Statistics Canada. 2025. About the Census of Environment. Available at: https://www.statcan.gc.ca/en/census-environment/about. Accessed October 22, 2025.
18 Government of Canada (2023). Partnership on Cooperation on Nature Capital Accounting, Environmental-Economic Accounting, and Related Statistics. Available at: https://www.canada.ca/en/services/environment/wildlife-plants-species/biodiversity/nature-capital-accounting.html. Accessed April 24, 2025.

ISSUE AND OBJECTIVES

While Canada has developed considerable expertise and data through the implementation of the SEEA, some important questions remain as to whether current natural capital accounting approaches adequately reflect the full range of nature's contributions to people and the economy. Certain physical stocks and flows may be underrepresented, and important cultural, social and non-market values of nature are not consistently captured in current approaches. Addressing these gaps is critical to ensuring that Canada's natural capital accounting practices effectively support progress toward the goals of the GBF.

In addition, advancing this work has significance beyond Canada. By identifying limitations of and potential improvements to current NCA approaches, Canada can help shape emerging international practices and contribute to strengthening the global application of NCA.

Against this backdrop, the roundtable explored these issues by considering the following two questions:

1. Is any natural capital inadequately represented in current NCA approaches?
2. Are there important values of nature that are not represented in current NCA approaches, including the SEEA?

SUMMARY OF DELIBERATIONS

Question 1. Is any natural capital inadequately represented in current natural capital accounting approaches?

In current NCA approaches, inadequate representation of certain types of natural capital is often a result of limitations in data or methodology. These limitations fall into two main categories:

1. **Lack of data on size and condition:**
   For some natural capital assets, there are insufficient data and information to accurately track their size, condition and changes over time. This lack of high-quality data makes it difficult to produce reliable estimates of stocks and flows, and introduces significant uncertainty in mapping these assets over space and time. As a result, any estimates of the ecosystem services they provide, or the benefits derived from them, are also uncertain.

   These data gaps are particularly evident for assets such as wetlands, grasslands, and coastal and marine ecosystems, where consistent national spatial coverage and long-term temporal data remain limited. In other

cases, such as soil health, species composition or ecosystem resilience, data exist but are not yet systematically integrated into accounting frameworks. While these challenges limit the precision of current SEEA-based accounts, the tools and systems needed to address them largely exist. Improved geospatial frameworks, systematic remote sensing and emerging machine-learning approaches can already support more accurate and frequent assessments of the extent, condition and services of natural assets.

In many natural capital accounting approaches, estimates of physical stocks and flows of services are linked to benefit flows expressed in monetary terms. This approach allows for the estimation of a natural capital asset's monetary value based on its physical extent and condition and the services it provides. It also enables assessments of how changes in these physical attributes might affect the asset's monetary value. However, the accuracy of such estimates depends not only on robust data about physical stocks and flows, but also on reliable methods for valuing them in monetary terms. Uncertainty in any part of this chain, especially regarding the condition and extent of natural capital, can be amplified in the process of translating physical data into monetary value, leading to significant uncertainty in final estimates. For example, uncertainty about forest health or growth rates can affect estimates of how much carbon a forest can store. If the forest is overestimated in its ability to sequester carbon, its monetary value in carbon markets may be inflated, leading to ineffective climate mitigation strategies. While this section identifies these limitations conceptually, later parts of the report describe practical ways to close the data gaps.

2. **Underrepresentation of assets without clear monetary value:**
   In addition to data limitations, many natural capital assets remain underrepresented in current accounting practices because they are difficult to express in monetary terms. Furthermore, assets that can be linked to exchange values, particularly those with observable market prices, such as timber or minerals, are more likely to be included in accounts. By contrast, assets that deliver significant non-market benefits, such as wetlands that regulate floods or landscapes of cultural importance, are less consistently represented. This imbalance results in an incomplete picture of nature's full contribution to well-being and decision-making.

   As discussed later in the report, some participants noted that this challenge may point to the need for complementary approaches that can

account for the many non-market and non-monetary dimensions of natural capital. Developing methods to capture these values, whether through welfare-based, participatory, or community-led approaches, would make accounting frameworks more comprehensive and relevant.

Workshop participants suggested that some existing data or methodological limitations might be overcome by:

- *Improved geospatial frameworks* that support accurate and precise estimates of natural asset location, size, condition and services at a given time over a range of spatial resolutions.
- *Improved temporal resolution* – Such enhanced resolution is necessary to detect potentially rapid changes in physical stocks and flows retrospectively, but also permits more reliable prospective (predictive) estimates of future changes. Systematic use of remote sensing is an important consideration in this regard since it can enhance the ability to detect the effects of measures to restore or rehabilitate natural capital assets through ongoing monitoring.
- *Increased use of machine learning* – The participants noted the potential for machine learning to process large volumes of data from remote sensing, thereby reducing an important barrier to enhanced spatiotemporal resolution and detection of trends in physical stocks and flows. After processing data, machine learning can aid in classifying and analyzing environmental data, thereby improving the accuracy, precision and comprehensiveness of natural capital assessments.
- *Increased attention to standardized protocols for describing the methods used to estimate physical stocks and flows* – Such protocols enhance transparency and help ensure both replicability and comparability of different methods across space, over time, or both.
- *Especially in the context of the GBF,*[19] *a clear operational definition of "biodiversity"* – Although the SEEA provides reasonably rigorous (though not always applicable or relevant) characterizations of natural capital in the form of natural resources and ecosystems, there are important components of biodiversity that are not well characterized. These include the number of individuals in a population (population abundances), the mix of species in an area (community composition) and the feeding relationships among species (trophic relationships). Participants noted that any characterization

19 Natural capital accounting can be used to support several headline indicators and targets for the GBF including headline indicator A.2 (natural ecosystem extent) and to assess progress toward Goal B, targets 9 ("Manage wild species sustainably to benefit people) and 11 ("Restore, maintain and enhance nature's contributions to people"). The SEEA implementation of NCA is also a component indicator for Target 14 ("Number of countries with implementation of the System of Environmental Economic Accounting").

must distinguish between the structural elements of biodiversity (e.g., the numbers and types of species) and the functional properties of communities and ecosystems (e.g., processes such as primary production; carbon storage, nutrient cycling) which underpin nature's services.

Workshop participants also noted the multiple benefits of increased spatial and temporal resolution of the size, condition and services of natural capital assets, including:

- increasing the ability to generate physical stocks and flows estimates at spatiotemporal scales relevant to decision making;
- designing policy interventions that explicitly take into account spatiotemporal variation (e.g., focus restoration actions in areas where they are most likely to be effective);
- conducting effective impact evaluation of policy decisions by facilitating such evaluations at the scales where effects are likely to be seen.

Question 2: Are there important values of nature that are not represented in current NCA approaches, including the SEEA?

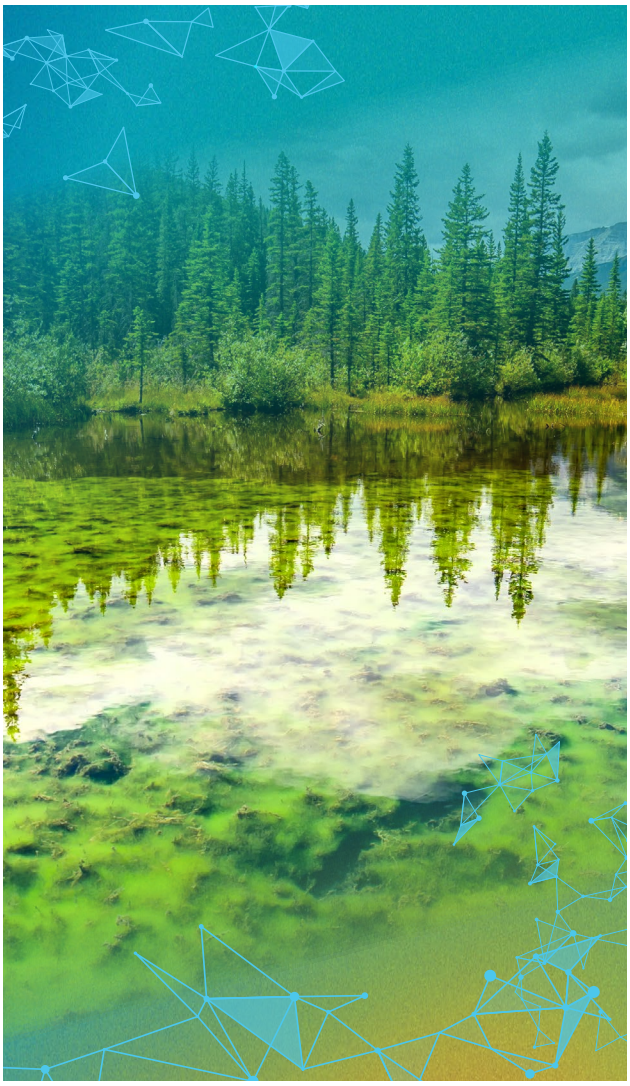
The roundtable participants discussed how natural capital is currently being valued, what is lacking and what opportunities exist for improvement. Participants pointed to three areas for improving the SEEA system that have been identified by the UN Committee of Experts on Environmental-Economic Accounting within the UN Statistical Commission, including: (i) species and genetic-level diversity; (ii) ecosystem resilience; and (iii) non-tangible (non-quantifiable) biodiversity benefits such as "existence value," "intrinsic value" and "religious and cultural values", which are currently either unrepresented or only partially addressed within the SEEA.[20] The discussion then focused on the importance of those benefits that are non-quantifiable from a natural science perspective. Often these are benefits whose valuation is characterized as non-monetary, such as cultural identity, spiritual significance, and the psychological and recreational benefits derived from a healthy ecosystem. To ensure that the full set of natural capital values, and their interrelationships, are captured, both monetary and non-monetary values must be included. Participants also underscored the need to engage Indigenous and local communities to understand culturally relevant and historically vested values of nature.

20 United Nations Department of Social and Economic Affairs. 2020. Natural Capital Accounting for Integrated Biodiversity Policies. Available at: https://seea.un.org/sites/seea.un.org/files/seea_-_biodiversity_-_web_ready.pdf. Accessed April 24, 2025.

BARRIERS TO COMPREHENSIVE VALUATION OF NATURAL CAPITAL

Participants noted that NCA methods require continuous improvement:

- Better descriptions of the methods employed to estimate monetary value, especially since a range of such methods exist (e.g., market versus non-market methods). Detailed descriptions not only increase repeatability but also facilitate comparisons among monetary valuation methods or between market and non-market methods in cases where both might be used. Such detailed descriptions are particularly important for quality assurance and quality control purposes to ensure reliable identification and valuation of natural capital.
- Especially for ecosystems, valuation of stocks and flows is based on the benefits flowing from the services provided. In some NCA approaches, reported valuation of services are not explicitly tied to the ecosystems that deliver them. Explicit mapping of services to ecosystems, even specific ecosystem components, is critical for distinguishing services that may be supplied by multiple ecosystems versus those that are uniquely provided.



VALUES OF NATURE NOT CURRENTLY CAPTURED

Values of nature that are not adequately captured in current natural capital accounting approaches were a key topic of discussion. In the SEEA, monetary valuation is based primarily on exchange value, such as market prices, because of the need to link to systems of national accounts. As a result, welfare values (those that reflect broader societal well-being), including the mental health benefits of spending time in nature or the role of green spaces in urban settings, are largely absent. Welfare values tend to be associated with regulating, supporting and (especially) social or cultural services, which are not easily captured through market-based approaches. In contrast, the monetary value of provisioning services can often be captured using market valuation approaches, as in the case of timber or water.

Participants also noted the challenges of accounting for non-monetary values. While monetary valuation typically uses currency as a common indicator – which makes it easier to compare and combine different values linked to the same natural capital asset – most natural capital accounting methods struggle to clearly define and represent non-monetary values. These include aspects such as spiritual or religious significance, cultural identity, and recreational or aesthetic value. Without clear ways to describe these values, it is hard to choose the right indicators, or to know if the same indicator can be used for different types of non-monetary values. For example, the cultural significance of a sacred site and the recreational value of a park may both relate to people's sense of well-being, but they may not be measured meaningfully using the same indicator. As a result, comparing or combining non-monetary values becomes difficult, even when such comparisons are appropriate. This challenge is even greater when a single natural asset holds both monetary and non-monetary value. The absence of reliable indicators also makes it hard to connect physical measures of natural capital — such as extent, condition and services — to the non-monetary benefits they support.

Many approaches to natural capital accounting (including SEEA) can accommodate non-monetary values. However, because these systems are designed to align with systems of accounts based on exchange value, non-monetary value would likely be in the form of supplementary information, possibly through separate or complementary accounts.[21] While this approach offers flexibility and room for future improvements, it may also lead decision-

21 See, for example: Turner, K., Badura, T., & Ferrini, S. (2019). Natural capital accounting perspectives: a pragmatic way forward. Ecosystem Health and Sustainability, 5(1), 237-241.

makers to view non-monetary benefits as less important[22] since they would appear as additional features rather than core components of the system.[23]

Participants agreed on the importance of community, regional and national natural capital assessments to capture more socially inclusive assessments of natural capital. They also noted the importance of transparency and community engagement in non-monetary valuation.

Incorporating the non-monetary values of nature held by Indigenous Peoples can be especially challenging. These values — deeply connected to cultural identity, heritage and relationship with nature — often depend not only on the extent, condition and services of natural assets, but also on how these assets interact and how people relate to them. This means such values cannot easily be separated and linked to individual natural assets using current classification systems. Moreover, even when the physical environment remains the same, Indigenous or community well-being can differ greatly depending on factors like community access, management or governance of those natural resources.

It was also noted by participants that monetary valuation may not be necessary for some applications and uses. For example, for the purposes of reporting under headline indicator A.2 (natural ecosystem extent) of the GBF, the physical accounting of natural capital extent, condition and services is sufficient.

Nonetheless, it was suggested that with the appropriate assessment system, monetary valuation of all natural capital assets may be possible, although it was recognized that some values, such as those associated with cultural services, may be incommensurate with monetary values.

Even when it is possible and appropriate to assign monetary values to nature, doing so may not always provide the best result. For instance, the commonly used "benefit transfer" method extrapolates value estimates from one community or region to others. However, the value of ecosystem services can vary widely depending on local factors, such as the size, condition and location of surrounding ecosystems. If decision-makers are not aware of the high level of uncertainty that comes with this method, the resulting monetary valuations may mislead their conclusions.

22 According to the Natural Capital Coalition, "an impact or dependency on natural capital is material if consideration of its value, as part of the set of information used for decision making, has the potential to alter that decision." (https://naturalcapitalcoalition.org/wp-content/uploads/2018/05/NCC_Protocol_WEB_2016-07-12-1.pdf, p. 123. Accessed April 24, 2025).

23 See, for example: Markandaya, A.Lliso, B. and A.H. Sorman (2024). Investing in Nature: Assessing the Effects of Monetary and Non-Monetary Valuations on Decision-Making. Ecological Economics Volume 219, 108135. https://doi.org/10.1016/j.ecolecon.2024.108135. Accessed April 24, 2025.

ADDITIONAL CONSIDERATIONS

In addition to the two main questions, the participants raised several issues with respect to the availability of data and methodologies most relevant for policy and decision making that often happen at the local or municipal level.

They noted the mismatch in geographic scale since SEEA is built to support national or subnational accounting, so its economic data typically reflects those broader scales. But in Canada, many key decisions affecting natural capital are made at much smaller and local scales, such as municipalities. To better support local decisions, there is a need for higher spatial resolution in natural capital accounting, both in physical characterization and valuation. This is especially important for responding to local events, like natural disasters, where detailed, location-specific data (e.g., from maps or census sources) are essential to assess economic impacts.

Participants also discussed the difficulty of scaling up or down when estimating natural capital. It is hard to apply local estimates to broader areas, or to infer local conditions based on large-scale data. As noted earlier, this issue is particularly problematic when it relates to monetary valuation methods, such as benefits transfer, which may become unreliable if context-specific differences are not properly accounted for in decision-making.

Lastly, the extent to which natural capital valuation actually informs policy and decision-making in practice was raised.[24] Some participants viewed the information on natural capital stocks and flows as simply insufficiently significant for many decision-makers. Others felt the issue was not about the relevance of this information to decision-makers, but rather about the tools used to support decisions which are not well suited to what decision-makers need to make informed decisions.[25]

24 See IPBES (2022). Methodological Assessment Report on the Diverse Values and Valuation of Nature of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Balvanera P., Pascual U., Christie M., Baptiste B., González-Jiménez D.(eds.). IPBES secretariat, Bonn, Germany. https://doi.org/10.5281/zenodo.6522522, KM6, p. xvi. Accessed April 24, 2025.

25 See, for example, Bateman, I.J., Mace, G.M. The natural capital framework for sustainably efficient and equitable decision making. Nat Sustain 3, 776–783 (2020). https://doi.org/10.1038/s41893-020-0552-3. Accessed April 24, 2025.

RECOMMENDATIONS

Canada has made international commitments to advance the sustainable use and management of nature's contributions to people, particularly through Goal B and related targets of the GBF. Domestically, Canada has committed to implementing the GBF via Canada's 2030 Nature Strategy, which emphasizes a whole-of-society approach.

Fulfilling these commitments will require the integration of nature's many values, both monetary and non-monetary, into policy and decision-making. In support of Canada's 2030 Nature Strategy, it is recommended that the Government of Canada:

1. Strengthen data quality and methods for natural capital assessment, in partnership with Canadian science-based departments and agencies by:
    i. enhancing the spatial and temporal resolution of data to improve accuracy (how close a measure is to its true or accepted value) and precision (how close a series of measurements are to each other);
    ii. making more systematic use of remote sensing data and expanding the use of machine learning for data processing;
    iii. refining and clearly documenting methods used to estimate natural capital stocks and flows;
    iv. standardizing an operational definition of biodiversity that is relevant to the Canadian context and consistent with the GBF.
2. Improve the transparency of methodologies and the contextualization of data sources for comprehensive natural capital valuation by:
    i. systematically documenting monetary (market and non-market) valuations and comparing methods of valuation with respect to their influence on monitoring and management decisions;
    ii. explicitly linking valued ecosystem services to specific ecosystems and their components to distinguish between general and ecosystem-specific contributions.

3. Incorporate both welfare and non-monetary values into future SEEA approaches by:

    i. using community-based participatory research approaches that empower Indigenous Peoples and local communities to prioritize natural capital valuation based on their lived experience;

    ii. developing accounting models that reflect monetary, welfare and non-monetary valuations, as appropriate, and tailoring them to the context and scale of analysis, while ensuring no one type of valuation dominates or overrides the others (i.e., avoiding zero-sum trade-offs).

4. Develop a Canadian strategy on Indigenous and community-led natural capital valuation that:

    i. recognizes the non-monetary values linked to cultural identity and relationships with nature, both historical and contemporary;

    ii. supports Indigenous-led biodiversity conservation based on natural capital valuation;

    iii. advances the implementation of decisions under the Subsidiary Body on Article 8(j) of the Convention on Biological Diversity as determined at COP16 in 2024 in which the interests and rights of Indigenous Peoples to participate fully in the Convention processes are respected[26].

26 United Nations Environment Programme. (2024). Decision 16/4. Programme of work on Article 8(j) and other provisions of the Convention on Biological Diversity related to indigenous peoples and local communities to 2030. Available at: https://www.cbd.int/doc/decisions/cop-16/cop-16-dec-04-en.pdf. Accessed April 24, 2025.

APPENDIX A:
Roundtable participants

Name	Position and affiliation
Participants from the Office of the Chief Science Advisor (OCSA)	
Mona Nemer	Chief Science Advisor of Canada (Roundtable Co-Chair)
Kyle Bobiwash	Researcher in Residence and Assistant Professor, Department of Entomology, Faculty of Agricultural and Food Sciences, University of Manitoba, Canada
David Castle	Researcher in Residence (Roundtable Co-Chair) and Professor, School of Public Administration and Gustavson School of Business, University of Victoria, Canada
Scott Findlay	Researcher in Residence and Retired Professor in Biology, University of Ottawa, Canada
External experts	
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Anne-Gaelle Ausseil	Principal Scientist, New Zealand Ministry for the Environment, New Zealand
Tomáš Badura	Marie Curie Fellow and Postdoctoral Researcher, Environmental Economics, Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam, Netherlands
Kenneth J. Bagstad	Research Economist, US Geological Survey, USA
Daniel Clarke	Economist, Organization for Economic Cooperation and Development (OECD), France
Alison Collins	Departmental Chief Science Advisor, Ministry for the Environment, New Zealand
Lesley-Anne Dams	Manager, Climate Change and Public Health Hub, Public Health Agency of Canada
Jason Duffe	Geomatics Research Manager, Environment and Climate Change Canada
Silvia Ferrini	Professor of Public Economic, University of Siena and Senior Research Fellow, School of Environmental Sciences, University of East Anglia, United Kingdom
Richard Heys	Deputy Chief Economist, Office for National Statistics, United Kingdom
Natalya Kharadi	Senior Consultant, Economics for the Environment Consultancy (EFTEC) Ltd, United Kingdom
Walter Lepore	Assistant Professor, School of Public Administration, University of Victoria, Canada

Geoff McCarney	Assistant Professor of Environment and Development, School of International Development and Global Studies; Director of Research, Institute of the Environment and the Smart Prosperity Institute, University of Ottawa, Canada
Rashed Nabi	Manager, Strategic Coordination and Engagement, Strategic Policy Branch, Environment and Climate Change Canada
Jennifer Rae Pierce	Chief Operating Officer, Urban Biodiversity Hub; Lead for the CEM Urban Ecosystems Specialist Working Group and Urban Alliance member, IUCN; Senior Policy Analyst, Climate Adaptation, Ministry of Agriculture and Food, British Columbia, Canada
Viktor Pirmana	Lecturer and Researcher, Faculty of Economics and Business, Universitas Padjadjaran, Indonesia
Susan Preston	Manager of Science-Policy Integration, Biodiversity Policy and Partnerships Directorate, Environment and Climate Change Canada
Rob Smith	Principal of Midsummer Analytics, Canada
Joe St. Lawrence	Acting Assistant Director, Environment Accounts and Statistics Division, Economic Statistics Field, Statistics Canada
Albert Ugochukwu	Applied Economist, School of Public Administration, University of Victoria, Canada
Henry (Hank) Venema	CEO, Strategic Systems Engineering Inc., Manitoba, Canada
Jennie Wang	Chief of Dissemination and Ecosystem Assets, Census of Environment, Statistics Canada
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